AMATEUR TELEVISION QUARTERLY

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Oct. Nov. Dec.

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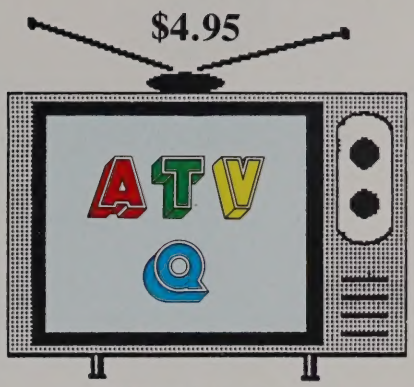

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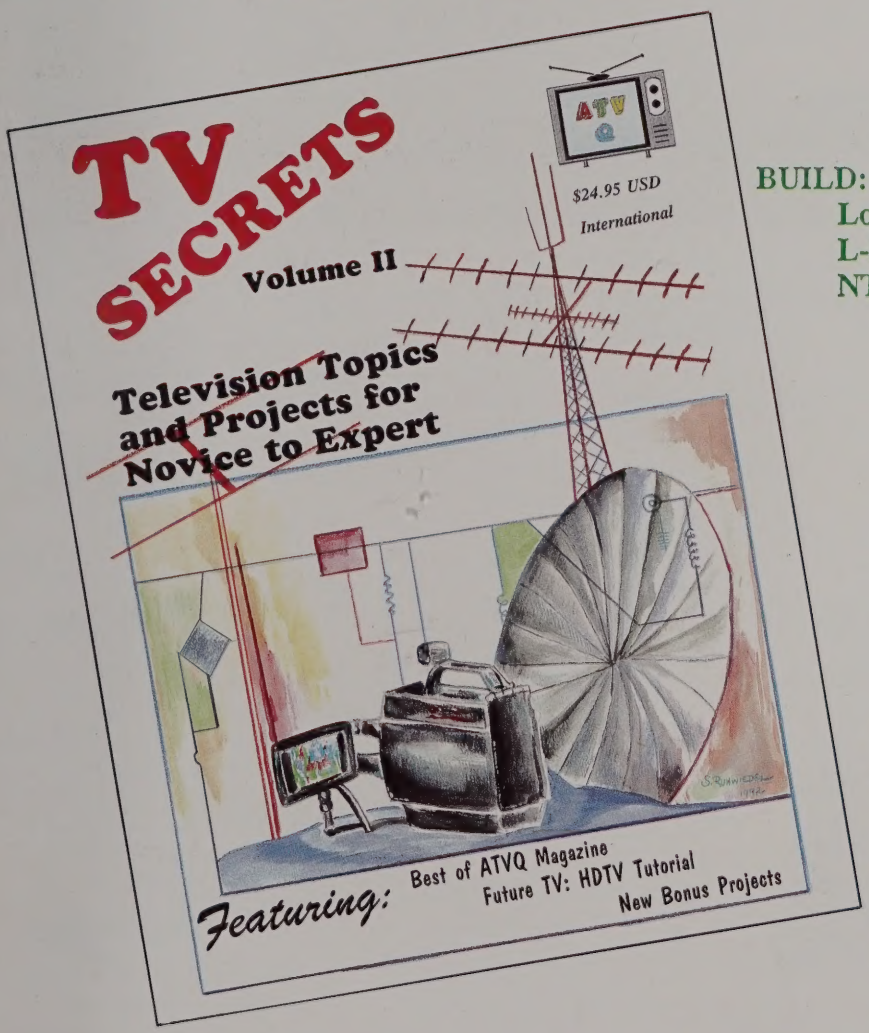

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NEW ATV COLUMN IN RADIO SCAN MAGAZINE

Radio Scan is now sporting a new monthly ATV column. The column is produced by Henry KB9FO, with material provided by ATVQ readers, re-written with introductions and explanations for the non-ATV'er. Your submissions to ATVQ can now reach an even wider audience through Radio Scan Magazine. Radio Scan has two editions, English and Spanish with world wide circulation. Radio Scan covers topics of general interest and all special modes including ATV, and Packet. For a sample copy, write to Radio Scan, 8250 NW 27th St., suite 302, Miami, FL, 33122-9920.

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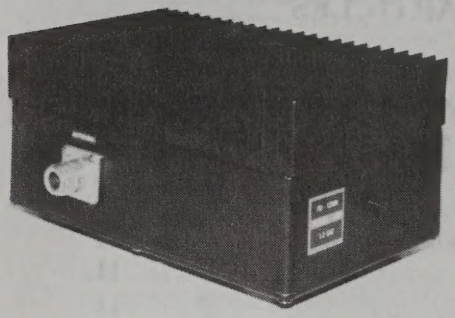

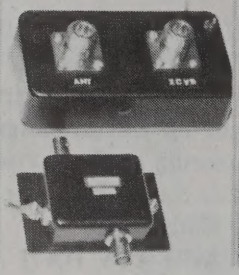

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SAU-11 902-928 Mhz. for FM use or ATV at reduced output ½ W. = 10 W. $25.00
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SAME WITH PREAMPLIFIER 145.00
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PD-440N-2 ½W. drive = 75 W. output T/R 285.00
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ABOVE: Large Heat Sink & Diecast Box
PD-440N-3 10 W. drive = 80 W. output T/R 235.00
ALL OF THE ABOVE USE POWER GAIN BLOCKS

MINI POWER AMPLIFIER FOR 420 - 450 Mhz.
PD-440N (Mini) 100 MW. = 2 W. & ½ W. = 6 W. $85.00
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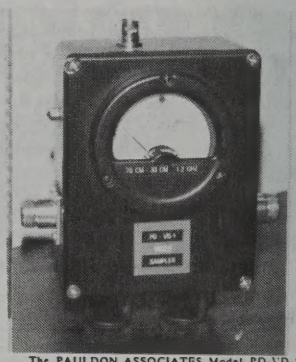
PD-33LP 902 - 928 Mhz. linear P.A. ½ W. = 7 W. output (2 stage) 119.00
PD-33HP linear P.A. 7 W. = 18 W. output 116.00
ABOVE are for 906 to 928 Mhz. band
PD-33VLP linear P.A. ½ W. = 1.5 W. out 49.00
PD-33VLP-1 P.A. for the (33 cm.) band 1 Mw. = 8 W. output 123.00
CAN BE USED FOR THE MINI POWER DRIVERS that are commercially available for home TV. Separate receiver and transmitters (EX: VC-2000)
P.A. for 1.2 Ghz. band
PD-1200N P.A. 1 W. = 18 W. (linear) $165.00
PD-1200N-1 P.A. 2 W. = 36 W. (linear & diecast) 285.00
DUPLEXED POWER AMP. for 70 cm. & 2 meters
PD-270-1 2-4 W. drive on either band = 35 W.
FM on 2 meters & FM or SSB on 70 cm. band 265.00

ATV DOWNCONVERTERS
GaAs Fet transistor used in both the 70 cm. & 33 cm. models TV channel 3 or 4
Tunes from 420 - 450 Mhz.
Board & all parts wired $60.00
Mounted in cabinet 73.00

Downconverter for the 902 - 928 Mhz. band TV channel 3 or 4
Board & all parts wired $68.00
Mounted in cabinet 80.00
Mounted in a diecast box 88.00

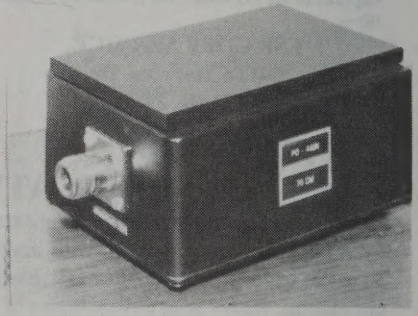
PREAMPLIFIERS
PD-440S 70 cm. 426 - 450 Mhz. preamplifier is a SINGLE GATE type using either a NEC 2SK-572 or a Mgf 1302 transistor. Noise figure is 0.6 db. and has a gain of 16 db. or better. It operates from a 12 - 13.8 volt supply, is diode protected and has a 5 volt regulator for stability. The source leads are by-passed with disc capacitors and the input uses a high "Q" piston Trim Pot. The output is not tuned so that the noise figure is consequentially low. A Toroid is used in the output, with capacitor coupling to the output. In this model either BNC or "N" connectors are used. $51.00
PD-440TRL is a tower mounted 70 cm. preamplifier whose description is similar to that of the PD-144TR-L except has "N" connectors 150 Watt thru capacity 119.00
FOR VOLTAGE FEED THRU COAXIAL CABLE 150 Watt thru capacity 129.00
PD-900 is a 902 - 928 Mhz. preamplifier with a noise figure of 0.6 - 0.7 db. and a gain of 14 to 16 db. with BNC .. 65.00
"N" Connectors 70.00
PD-900TR is an R.F. sensed preamplifier and can be transmitted through with a maximum power of 20 W. 119.00
PD-1200 — SAME AS THE PD900 except 1.2 Ghz. ..... 65.00 and 70.00
PD-1200TR 1.2 Ghz. preamplifier with R.F. sensed T/R switching (20 W.) 119.00
PD-2300 is for the frequency range of 1.8 - 2.4 Ghz. (No T/R Switching Capability) 72.00

OTHER PRODUCTS AVAILABLE: FM TRANSMITTERS AND RECEIVERS, SAMPLERS (VIDEO), Etc.
CALL OR WRITE FOR ADDITIONAL INFORMATION OR CATALOGUE.



The PAULDON ASSOCIATES Model PD-VD-1 ATV VIDEO SAMPLER unit picks up your transmitted Fast Scan TV signal by sampling the transmission line with near negligible insertion loss. It employs 2 Type 'N' connectors for input and output connections. The furnished BNC mentioned on the top of the unit is used as a video output port, useful for connections to a CCTV monitor or scope (for adjusting proper video and sync levels). Transistors included in the electronic circuit design are: Q1-ECG 123, Q2-ECG 123 and Q3-ECG 159.

$63.00,

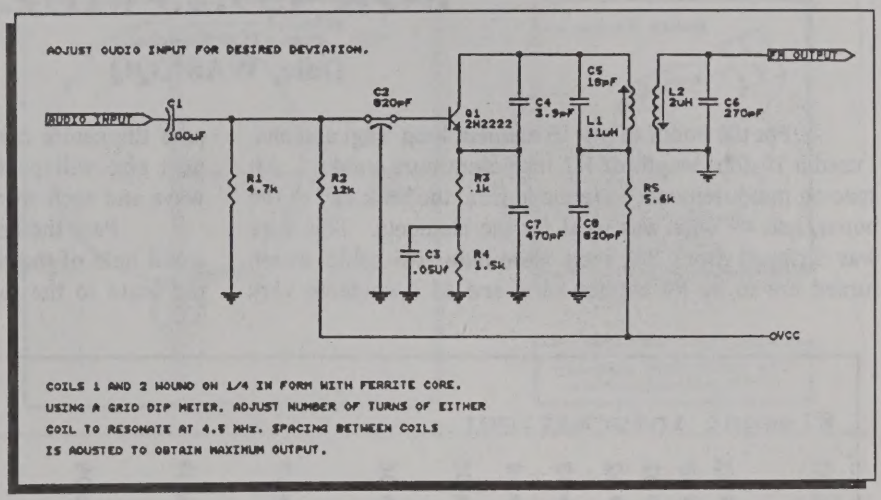


INTERDIGITAL FILTERS
PD-1002 439.25 MHZ.
$150.00
PD-1004 910.25 MHZ.
$145.00
7 pole, 7 adjustable tuning rod design. Freq. adjustable to 6 MHZ. by rotation of the screws at the end of each rod. Insertion loss less than 1db. Out of band attenuation 80 db. +/12 mhz. from theVSB passband.Atten. at the LSB sound sub. carrier 30db.
OTHER FILTERS AVAILABLE
WRITE OR CALL

4.5 MHz FM Modulator

This circuit is unique since it incorporates an audio amplifier, pre-emphasis, oscillator, and an FM modulator using only one transistor. It doe not require a varicap diode.

The transistor Q1 works basically as an audio amplifier with heavy DC degeneration. This stabilizes the operating point of the transistor and assures that the collector capacity of the device does not change with temperature. However, the collector capacity depends on the voltage between collector and emitter of the device and thus changes with the audio voltage occurring across the load resistor. A 4.5 MHz tank circuit is connected in series with the audio load resistor. C4 provides a positive feedback path to the emitter resulting in oscillations at 4.5 MHz. Feeding an audio signal into the base of Q1 results in the desired Vce voltage change which in turn changes the output capacity of Q1, and as a result FM modulates the 4.5 MHz signal.

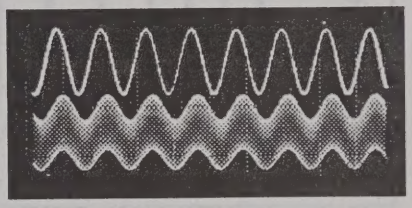


The scope pattern across R5 shows both signals added (not modulated!) on top of each other. The second tuned circuit which has only a reactance for 4.5 MHz eliminates the audio portion of the signal appearing across R5 and yields an FM signal with an insignificant amount of AM at +/- 50 Khz deviation. R4 and R5 in the emitter afford stable collector current over the desired temperature range while R5 and C1 form a time constant of 75 usec for the required pre-emphasis.

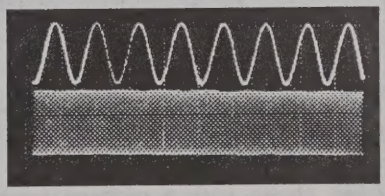
The third photograph shows the 4.5 MHz spectrum with a +/_ 50 Khz modulation at a modulation frequency of 400 Hz.

In order to maintain the excellent frequency stability, the circuit should be operated from a regulated supply. 73's N9BRL, Rolf Spies 8502 N Oketo Avenue, Niles, IL 60714-2006

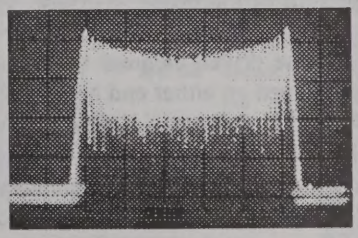
Top: Audio input at point (1). Bottom: Audio added on top of 4.5 MHz osc. Signal across load resistor point (2).



Top: Audio input point (1). Bottom: FM modulated output at point (3).



FM spectrum
4.5 MHz +/- 50 Khz at 400 Hz.
Horizontal 20 Khz/div.



16 ELEMENT LOOP YAGI FOR 439.25 MHZ

from ATCO newsletter

Dale, WA8KQQ

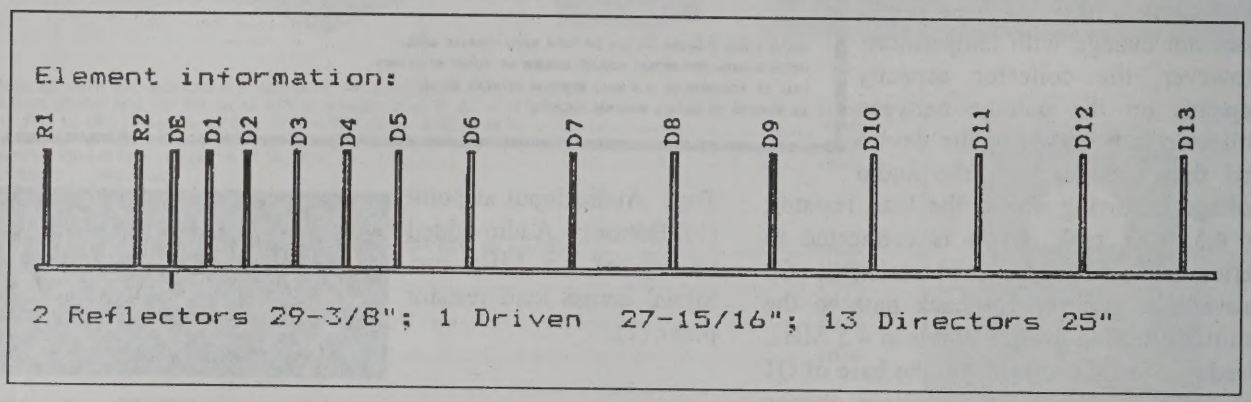
For the boom of my 16 element loop Yagi antenna, I used a 10-foot length of 1/2 inch aluminum conduit. All spacing measurements were made from the back end of the boom, and #9 wire was used for the elements. This wire was stripped from 3/4 inch aluminum TV cable which turned out to be #9 copper wire, and so it soldered very well.

The reflectors and directors were cut to length, flattened 1/2 inch on either end, and formed into a circle. The ends were soldered together, and then ground or filed down to wire size. One-half inch conduit clamps (the kind with a bolt through them) were used for the element mounts. I used a file on edge to file a notch across the top of each clamp with a propane torch. This provided a sturdy mount that looked quite decent. The bolt through the bottom of the clamp provides for easy adjustment for tuning the antenna.

The driven element was made using the same #9 wire flattened on either end and also in the center. A piece of brass tubing from a hobby shop was used for a feed. Drill a hole in one end and in the middle of the #9 wire to pass the brass tubing through and a small hole on the other end of the #9 wire for the center conductor. Form the circle then pass the brass tube through the two large holes and solder. Then set the ring on top of a conduit clamp with the tube passing down through the hole and solder.

Make the measurement for the spacing of the driven element on the boom and then drill a hole through the boom to snugly pass the brass tube. Slide the tube through the hole and let the clamp spread to snap on the boom. Drill tiny holes on either side of the clamp through the boom and set with two small metal screws. Two different sizes of brass tube can be used. One size will pass the center conductor with insulation (RG-58) or the next size will pass with ground braid also. I tried both ways and each worked okay.

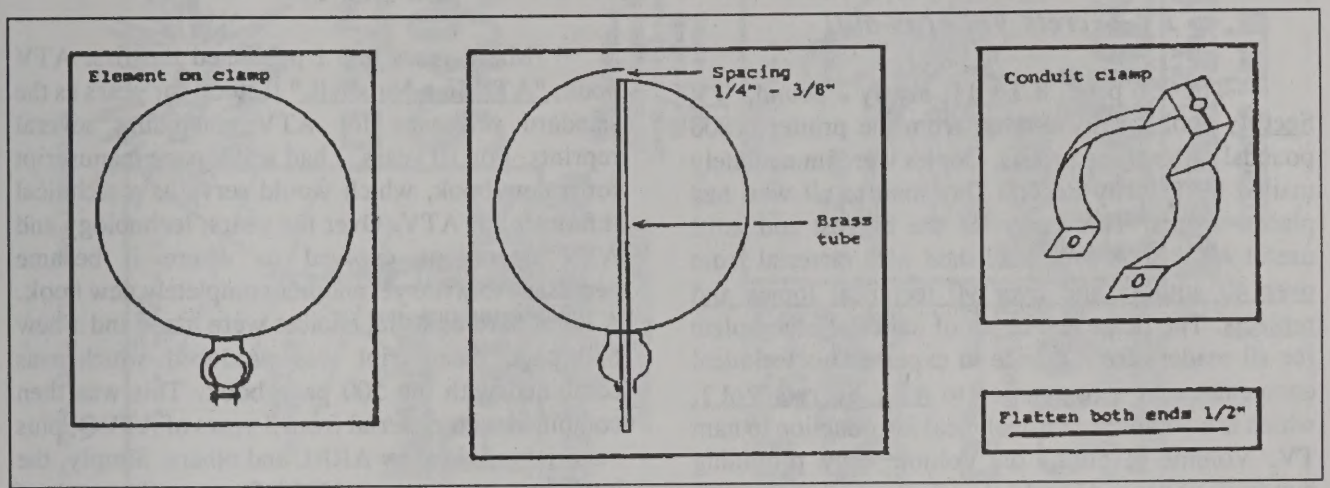
Pass the center conductor of the coax through the small hole of the driven element and solder. Then solder the braid to the top of the brass tubing. A coax fitting under the boom may be used or a balun may be used if using twin lead as I do.



This antenna is on a test stand at 22 feet and my normal 48 element collinear is at 55 feet. Dick, W8RVH, 42 air miles away on the morning we tested the antennas, gave me a P-4.5 on the collinear and a P-3.5 on the loop yagi. This was a very good report considering the difference in height of the two antennas. I also found that on 70 cm the loop tunes differently than on 1.2 Ghz. At 1.2 Ghz, the loop can be tuned by changing the shape of the driven element. On 70 cm, this did not make much change at all, but moving the first director made a considerable change. I think this is a good antenna, and I have just finished the second one. I am going to stack a pair to see what happens.

I would appreciate receiving any suggestions anyone may have. My telephone number is 513-548-2492, or mail address is 225 Riffle Avenue, Greenville, OH 45331.

LOOP YAGI



Element information:

2 Reflectors 29-3/8"; 1 Driven 27-15/16"; 13 Directors 25"

Spacing in inches:

R1 = 1	D2 = 18	D6 = 39-5/16	D10 = 82-1/16
R2 = 9-5/16`	D3 - 23-3/8	D7 = 50-1/16	D11 = 92-3/4
DE = 12-1/16	D4 = 28-5/8	D8 = 60-11/16	D12 = 103-7/16
D1 = 15-1/2	D5 = 32-3/8	D9 = 71-3/8	D13 = 114-1/8

COMET
ANTENNAS FOR THE PROFESSIONAL AMATEUR

CYA-1216E
16 Element Yagi Beam 1260-1300MHz
Gain: 16.6dBi
VSWR: 1.5:1 or less
Impedance: 50 ohms
Max. Power: 100 watts
Polarization: Vertical or Horizontal
Length: 4'5"
Weight: 7 lbs. 11 ozs.
Mounting Mast Diameter: 1'-2½"
Connector: N-Type
Construction: All Aluminum

CA-1221S
Mono Band
1260-1300MHz
Base/Repeater Antenna
1/2 Wave 21 Step
Collinear
Gain: 15.5dB
Impedance: 50 ohms
VSWR: 1.5:1 or less
Max. Power: 100 watts
Length: 8' 6"
Weight: 2 lbs. 3 ozs.
Mounting Mast Diameter: 1¼-2½ inches
Connector: N-Type

PYA-913
Base 13 Element Yagi
904-920 MHz
Gain: 15.8dBi F/B ratio over 20dB
Max. Power: 150 watts
VSWR: 1.5:1 or less
Length: 4' 8"
Connector: N-Type
Construction: Aluminum

CA-1243Z
Dual Band
440-450MHz
1250-1300MHz
Base/Repeater Antenna
5/8 Wave x 4 446MHz
5/8 Wave x 9 1200MHz
Gain: 446 9.4dB, 1200 12.8dB
Impedance: 50 ohms
VSWR: 1.5:1 or less
Max. Power: 446 150 watts, 1200 50 watts
Length: 7' 5"
Weight: 2 lbs. 8 ozs.
Connector: N-Type
Construction: Heavy Duty Fiberglass

FP-19
Base/Repeater
905-925MHz
Gain: 16dBi
Impedance: 50 ohms
VSWR: 1.2:1 or less
Max. Power: 100 watts
Length: 7' 4"
Connector: N-Type
Construction: Heavy Duty Fiberglass

MINI SWR Power Meters

		Max. Power	Insertion Loss
CM-200	140-150MHz	45 watts	0.1dB
CM-300	200-240MHz	60 watts	0.2dB
CM-400	420-460MHz	50 watts	0.2dB
CM-420	140-460MHz	50 watts	0.1-0.2dB
CM-900	840-950MHz	60 watts	0.2dB
CM-1200	1225-1325MHz	60 watts	0.25dB

Measurements: 2.25"w x 2.25"h x 1.1"d
Weight: 5.25 oz.
CM-200, 300 and 400 have SO 239 Connectors
CM-420, 900 & 1200 have N Connectors

CF-4130 446/1200MHz
dB Loss: 1.3-460MHz 0.2dB, 900-1400MHz 0.3dB
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NEWEST ATV BOOK

TV Secrets Vol II is out!

The 296 page, 8.5 x 11, nearly 2 pound, **TV Secrets** book finally arrived from the printer (1800 pounds!) after three proofs. Copies were immediately mailed by Priority Second Day mail to all who had placed orders. This is by far the biggest and most useful ATV book ever published with material from over 40 authors and over 90 technical topics and projects. The range and depth of material is complete for all readers from novice to expert. This technical compendium is a companion to **ATV Secrets Vol I,** which is a complete non-technical introduction to ham TV. Volume II builds on Volume I by providing hundreds of pages of build-it projects in all areas, plus more in-depth technical explanations of various aspects of video and RF.

In addition to material from past issues of ATVQ, the book contains new material from several sources to add valuable ancillary information not normally associated exclusively with ATV, such as VHF-UHF propagation.

Comments received from purchasers of the new book have all been extremely positive and indicate that this book is so complete it will no doubt be the standard reference for ATV for years to come.

Volume I of ATV Secrets has sold over 2500 copies in its first year. Pre-publication sales of Volume II have been equally as brisk, confirming that technology and home construction is NOT dead in ham radio!

NEW HAM VIDEO!

The good folks in Washington State have done it again. Chuck Zapella, creator and producer of the ham movie, "More than Radios" which was sponsored by Icom American and ATVQ, among others, has produced a new ham Movie, "More About Radios." ATVQ received an advance preview copy and the production is excellent. This is a great item for a club meeting or for presentation at non-ham gatherings as an introduction to ham radio.

The production standards are very high and the story moves right along. There is a review of the movie later in this issue.

The Volume II Saga

Many years ago I published the first ATV book, **"ATV in a Nutshell."** It stood for years as the standard reference for ATV, including several reprints. For 10 years, I had a 500 page manuscript for a new book, which would serve as a technical reference for ATV. Over the years, technology and ATV operations evolved to where it became necessary to write yet another completely new book. A lot of hard editorial choices were made and a new 650 page manuscript was produced which was combined with the 500 page book. This was then combined with material from 5 years of ATVQ, plus material provided by ARRL and others. Simply, the book was too big to publish! So a year's worth of work went into revisions and editorial decisions to put together the most comprehensive, up-to-date, accurate, compendium of useful information. After several proofings, the printer called and said it would be cheaper to have MORE pages because of press size! So we put more back in! The result was an astounding 296 pages, perfect bound, TV Secrets Volume II.

As with our previous publications, it is destined to become another standard reference for ATV for years to come.

AEA NEWEST ATVQ OUTLET

ATVQ is proud to inform its readers that the long time support we have received from AEA has been enhanced. AEA now distributes ATVQ magazines with their products to promote ATV awareness and ATV activity. AEA is among several ATV dealers and manufacturers who actively promote ATVQ in their catalogs and stores.

AEA is also actively seeking dealers to have their ATV equipment on display for hams to see. It is reported that some stores are reluctant to had an ATV station set up because the employees are not familiar with ATV. (Perhaps they should read ATVQ and TV Secrets books!). If you local ham store does not have an ATV station set up, why not help them set one up and use the opportunity to attract new ATV'ers to your area! Be sure to include a sign to inform visitors of your local ATV nets and club meetings! This is a cheap and easy way to keep ATV in front of area hams.

Do it before the snow flies!

A special offer to our friends...

Thank you for all your calls and letters about 'More than Radios' over these past years! Many of you wanted a video to help you recruit new hams. So, we did what you suggested. We call it 'More about Radios.' As our way of saying thanks for your support, we have decided to make our new video tape available to you, before we make it available to others.

This all new 28 minute program has been created to show what Amateur Radio is really all about! You can use 'More about Radios' as a recruitment tool for presentations without the technical jargon. The video can stand alone, or be part of your presentation to promote Amateur Radio in your community. 'More about Radios' is an excellent addition to any school or your club's library.

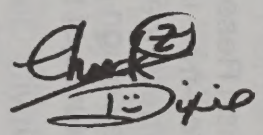
Join Gib again as our host, as he guides the audience from one adventure to another. We documented the events of successful Amateur Radio clubs and their members for several months. Hear and see the excitement of Amateur Radio by new hams as they discover their new hobby!

Your audience will find out why people, just like you, became hams and why people all over the world are tuning in! They will learn about a simple method to locate a club in your area and finding other resources to help them become an Amateur Radio Operator. For best results, start by showing our motivational video, 'More than Radios.' Then, continue with the new video, 'More about Radios' to introduce basic concepts about Amateur Radio.

'More about Radios' is available in VHS. Shipping outside North America and versions in PAL, SECAM or other formats are available at an additional charge. Please let us know your needs.

For those that have 'More than Radios' in the old box and label, we can provide a new matching box and label for $3.95. To order, check the box(s) on card and return it with your check or money order. Thanks for watching!

Chuck KE7SA and
Dixie N7OYY



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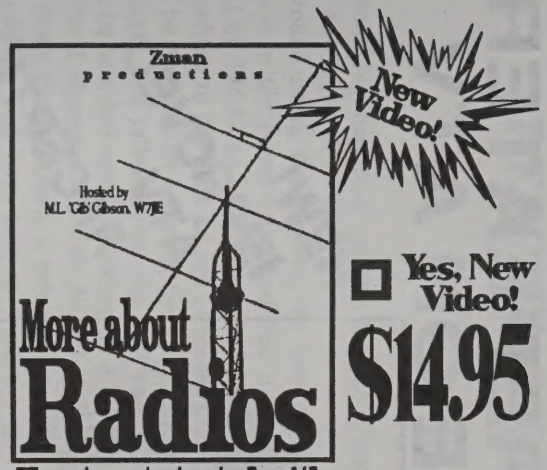

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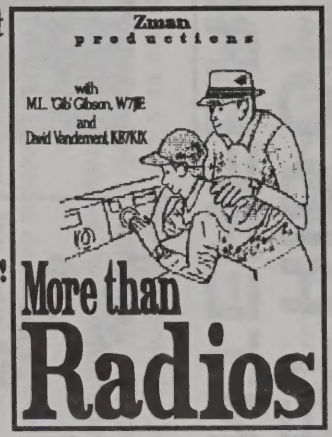

GET RID OF FM REPEATER INTERFERENCE ON ATV

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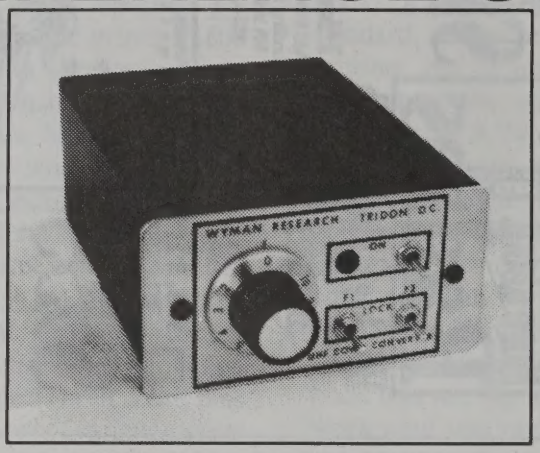

NEW! IMPROVED ATV RECEPTION

The new Wyman Research DC-2 downconverter makes it possible to receive the interference-free lower sideband of ATV transmissions. The unit eliminates the interference from FM repeaters which operate in the ATV upper sideband. The design principles are described in *73* magazine, March 1992. The many features of this new development are:

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Don and Sue Miller
W9NTP W9YL

RESCUE ON UNCOMPAHGRE PEAK

Bob Witte, KBØCY

Something happened on the way to Uncompahgre Peak on August 8, 1992.

Around noon, my brother, my two nephews and I made it to the summit and had just signed the log. I called on 146.52 and contacted Chris, NQ5V, who was somewhere to the east of me (Creede, I think). This must be his summer location, since his callbook address is Texas. We talked about the trail up Uncompahgre, since he was interested in hiking it.

After I signed clear with NQ5V and was about to start down the mountain, a teenage boy came up to me and said he had been sent to "find the guy with the radio" because a girl had been hit by a rock down below and was hurt. I am not sure how they knew I had a radio, other than I used it once on the way up the trail. The story seemed rather sketchy and I was skeptical but asked NQ5V to standby on frequency because we may have a medical emergency. At that time, Arnold, W7JRC, from Cedaredge, CO, came on frequency and said he had a phone nearby. (NQ5V did not have a phone available.) A second, older teenager came up the trail with more information. He said he was a pre-med student and had search and rescue experience. He had more detailed info which made the story more clear. At this time, I concluded that we had a real emergency and asked W7JRC to call the authorities. I handed my HT to the older teenager and had him describe the victim's condition to W7JRC. W7JRC had some trouble contacting the police, but eventually got through to the Ouray County Sheriff's office. (It turned out we were in Hinsdale County, but we did not know that at the time.)

Jim, NR5Y (also close to Creede, I think) came on frequency and said that he was close to a telephone. I was not always able to communicate with NR5Y, so NQ5V relayed to NR5Y. Since W7JRC was having trouble with getting the telephone call through, I asked NR5Y to also try to place a call. He called the Mineral County Sheriff, who relayed to Hinsdale county. All this time, I was moving down the mountain to try to get closer to the victim without losing my radio contact. About this time, my HT battery went dead, so I switched to my spare. (Good thing I had one!) As I moved onto the saddle below Uncompahgre, I lost contact with W7JRC and contact with NQ5V got much worse, but usable. About this time, Doug, NØLAY, came on the air and his signal was very strong at my location which allowed me to stay on low power and conserve my HT batteries. NØLAY apparently came on the air in response to a call from the Hinsdale County Sheriff. NØLAY also had a radio which was on the sheriff's frequency and relayed information from me to the sheriff's dispatch.

I had not proceeded down any further because I was certain that I would lose radio contact with NØLAY. The victim had several people with her that had First Aid training and was about 1000 feet below me at the bottom of a cirque. I sent the older teenager back down to the victim with instructions to signal me as to her condition. We both had signal whistles–two whistles meant her condition was the same (stable), three whistles meant her condition had deteriorated. After I got the two whistles back, I felt like things were going to be OK.

About that time, NØLAY relayed that an ambulance had been dispatched to the trailhead and a search and rescue person was on the way up the trail with a trail bike. Also, a helicopter had been dispatched from Montrose. It took us a little while to communicate to the sheriff where the victim was, but we had a pretty good topo map, so we eventually gave them an accurate fix on the location. As I was listening to NØLAY relay, I realized that my Kenwood TH-77A could receive most police frequencies. NØLAY provided me with the frequency and I programmed it into the HT, scanning between 146.52 and the sheriff's frequency. This allowed us to listen in on what was going on. In fact, many times I was clearly hearing the various parties while they were having trouble communicating.

The S&R guy on the trail bike made it to the accident scene without us noticing him. He had parked his bike about half a mile away from us and had scrambled down to the victim. The first time I was aware of his position was when he transmitted from the accident site. He confirmed that the girl was pretty bashed up, but stable, and needed a helicopter ride out. About this time, the sheriff's dispatch reported that the helicopter was about 5 minutes out (I think it turned out to be more like 15 minutes away). Soon the helicopter came up on the sheriff's frequency and I could hear the S&R guy coordinating with the helicopter pilot. The two-seater helicopter landed and they put the girl in the second seat. Apparently she was stable enough to walk to the helicopter with some assistance. The alternative was to put her outside the chopper in a litter. The helicopter lifted off and set back down a few minutes later near the ambulance which was near the trailhead. The two-seater

chopper was not a medical evacuation helicopter and the plan was that Flight-for-Life from Grand Junction would pick up the victim at the ambulance location. It turned out that Flight-for-Life was unavailable so they took the victim to a hospital by ambulance (to a local clinic, then Gunnison, I think).

We stayed on the ridge until the chopper headed for home, then we did the same. On the way down, the S&R guy on the trail bike caught up with us and we talked about the accident. He said the girl lost some teeth, had facial cuts, internal bleeding and swelling in the face, but was in stable condition. He said that without the radio report that they would be just getting the initial call at the time he was heading home. That is, we saved about 5 hours on the response time with amateur radio.

I have carried my HT on every 14er hike I have ever done and had considered the possibility of using it for emergency communications. I guess I never gave it too much though because people venturing into the back country need to have a self-sufficient attitude. That means being prepared and preventing or handling any emergency situation on your own. But the unexpected happens, and here I was in the middle of a medical emergency. It certainly has caused me to take this emergency communications thing more seriously.

Things I learned that day:

* Always carry an extra HT battery (or two)
* Always carry a decent portable antenna (more than a rubber duck)
* Always carry a good topo map, even if you don't need it to follow the trail.
* Make note of what county you are hiking in when in unfamiliar parts of the state. This aids in getting to the right Sheriff's office. (This is important because the person you contact via radio is likely to be two or three counties away.)
* My signal whistle (which has caused considerable abuse from a few hiking companions) is actually useful.
* Extended coverage receive is very useful in emergencies. (I am still thinking about extended transmit–I clearly could have used it in this case.)

I was very pleased that everyone reacted quickly but in a professional manner. The radio amateurs all helped out when they could but stayed out of the way when appropriate. I am sure we can find some things that could have been done better, but I felt like things went well overall.

FCC RULES PROPOSAL COMMENTS

ARRL

Attn: Dave Sumner, Secretary

I forgot to talk to you about this problem at the LA Convention, and I have been getting some concerned calls on it from ATV repeater owners. The audio and video Space Shuttle retransmissions may be endangered by the revised part 97.113.

As I read Docket 92-136 on Page 64 of the Sept. 92 QST, paragraph 4e, the Shuttle cannot be retransmitted on a "regular basis", and only "as an incident to normal amateur radio communications." Most all Shuttle retransmissions are regular on known dedicated repeaters. Many individual amateurs and schools enjoy the Shuttle video and audio because they know which repeaters will have it any time there is a mission. This is especially important for those involved with SAREX. Is there some wording that can separate the Shuttle communications from the weather broadcasts as far as regular basis?

We also have been taking 97.113 exception to retransmit the Shuttle communications to supersede the prohibition to transmit music. Music is sometimes part of the Shuttle communications and it is not practical to insure that the music audio will be shut off quick enough. It is not unlike the problem that digipeaters have had.

I talked to Jay Holliday about it because I worked with him on getting the original Space Shuttle audio and video retransmission waiver as a member of the JPL Radio Club. He may be talking to you about it when he gets back from a trip. Meanwhile, he suggested you might know who to mention this to and is handling the comments for the League.

Thanks,

Tom O'Hara, W6ORG, TA

HAM RADIO TO THE RESCUE IN SHUTTLE COMMUNICATIONS BLACKOUT

Newington, CT - (September 18, 1992) -- Amateur Radio became a new star in space at 3:00 a.m. Friday when a small, battery-powered ham radio aboard the space shuttle Endeavour successfully linked the astronauts with NASA mission control after computers handling official communication from earth failed briefly.

The ham radio, a tiny two-meter transceiver installed on the shuttle as part of the Shuttle Amateur Radio Experiment (SAREX) is used by astronauts to talk with school children and licensed Amateur Radio operators on earth. Shuttle crew members Jay Apt (Amateur Radio call signal N5QWL) and Mamoru Mohri (7L2NJY) operate the radio during contacts.

Ordinarily, mission-related communication is controlled by computers in White Sands, New Mexico. The computers coordinate the flow of data between mission control in Houston, Texas and orbiting communications satellites around the globe. The satellites, in turn, relay messages to the shuttle, providing virtually constant communication regardless of the shuttle's position.

But a glitch in the White Sands computers plunged the shuttle into a temporary communication blackout. Mission controllers could hear pilot Jay Apt, but could not respond to him as the shuttle orbited the earth.

Amateur Radio came to the rescue. At the time of the outage, the shuttle was coming over the horizon toward a scheduled Amateur Radio rendezvous with Queensland University of Technology in Brisbane, Australia where ham operator Andy Joyce (VK4KIV) was standing by for a scheduled contact. Mission control in Houston asked Lou McFadin (W5DID) and Doug Loughmiller (KO5I), ham operators in the nearby SAREX control room, to relay a message to Apt via Australia that communication would soon be restored.

"Even though SAREX is primarily an education program, we've always recognized that Amateur Radio could be a backup link in a NASA space shuttle mission," says Roy Neal (K6DUE), Chairman of the SAREX working group. "Thankfully, this was only a routine problem. Even so, the performance of hams operating SAREX lived up to our expectations, and helped keep the astronauts posted. This kind of people-to-people communication is what Amateur Radio is all about, whether it's contacting friends and family after a major storm here on earth, or getting around a minor malfunction in space".

McFadin says that the students in Australia were so startled by the unexpected turn of events that they were unable to remember the questions they had prepared to ask Apt as the shuttle passed overhead. McFadin says the communication outage lasted 20-25 minutes. SAREX is an education program developed jointly by the American Radio Relay League (ARRL), the Radio Amateur Satellite Corporation (AMSAT) and the National Aeronautics and Space Administration.

NEW HAM RADIO VIDEO

Zman Productions

This all new 28 minute program has been created to show what Amateur Radio is really all about! You can use **"More about Radios"** as a recruitment tool for presentations without the technical jargon. The video can stand alone, or be part of a presentation to promote Amateur Radio in your community. **"More about Radios"** is an excellent addition to any school or club library.

Join the host, M. L. "Gib" Gibson, W7JIE, as he guides the audience from one adventure to another. Zman Productions documented the events of successful Amateur Radio clubs and their members for several months. The video introduces easily understood topics such as radios in an apartment, mobile operation, public service, emergency communications, swap meets and field day operations. Considerable attention is made to locating a local ham radio store and what they have to offer, clubs for those that want to participate, and "Elmers" for personal training and assistance. A segment with children studying to become hams is also featured. The video uses interviews and narration to explain the action footage of the varied events as they happened.

For best results, start by showing Zman Productions" earlier motivational video, **"More than Radios"** which was released in 1991. Then, continue with the new video, **"More about Radios"** to introduce basic concepts about Amateur Radio.

"More about Radios" is available for $14.95 plus $3.00 shipping and handling. **"More than Radios"** is being rereleased for $9.95 plus $3.00 shipping and handling in the new matching box and labels. For those that have **"More than Radios"** in the old box and label, Zman Productions can provide a new matching box and label for $3.95 which includes shipping and handling. Both videos will be ready to ship by the end of October.

"More about Radios" is available in VHS. Shipping outside North America and versions in PAL, SECAM or other formats are available at an additional charge. Please write Zman Productions and let them know your needs.

HAWAII to CA ATV!

Just talked to Gordon West, WB6NOA, Sync buzz was heard in his SSB receiver at Palos Verdes on 434.0 June 2 from KH6IAA. KH6IAA was up the side of the Mauna Loa Volcano on the Big Island of Hawaii. FM voice also keyed up the Catalina 2 meter repeater during this opening.

Tom O'Hara, W6ORG

AMATEUR RADIO SPECTRUM PROTECTION ACT CLOSER TO PASSAGE AS 102ND CONGRESS ADJOURNS

Newington, CT. (October 9, 1992) -- A proposed law to protect Amateur Radio frequencies gained majority support in the House of Representatives and more than one-third support in the Senate before the 102nd Congress adjourned, according to the American Radio Relay League (ARRL).

The proposal, the Amateur Radio Spectrum Protection Act (H.R.73/S.1372), has been enthusiastically backed by the nation's approximately half a million Amateur Radio operators. To date, 219 Congressional representatives and 35 Senators have signed on as co-sponsors, more than satisfying ARRL's initial objective of gaining broad bipartisan support.

"With half the House and more than a third of the Senate already co-sponsors, Amateur Radio has a big head start in working with the 103rd Congress next year," says ARRL President, George Wilson (Amateur Radio call sign W4OYI). "The fact that we have this many friends on the Hill does not go unnoticed at the Federal Communications Commission."

"ARRL members did a wonderful job of explaining the need for this bill to their legislators," Wilson says. "The League's Washington team followed up with literally hundreds of in-person briefings that gave our elected representatives a much clearer picture of Amateur Radio and its importance as a national resource."

Wilson says that Legislators responded positively to the fact that amateur spectrum is like a public park that is used not only for the benefit of the licensees, but also for the general public.

The Amateur Radio Spectrum Protection Act was introduced in the House by Representative Jim Cooper (D-TN) and in the Senate by Senator Al Gore (D-TN) after passage of the Federal Communications Commission (FCC) Authorization Act in 1988. That act includes a provision strongly encouraging and supporting the Amateur Radio service and its emergency communications efforts. It requires government agencies to "take into account the valuable contributions made by amateur radio operators when considering actions affecting the amateur radio service."

While not involving Congress in managing the radio spectrum (a regulatory function of the FCC), the proposed legislation requires the FCC not to diminish the amount of radio frequency already available for Amateur Radio, and to provide equivalent replacement spectrum for any frequencies that are reallocated.

Federal Communications Commission
1919 M Street NW
Washington, DC 20554
Subject: Amateur TV Repeater
Dear Commission Person:

Recently I was informed that there was a request with the Western PA Repeater Coordinator to add another Amateur Television repeater split in Pittsburgh. The frequency pair was to be 434.0 input, 421.25 out.

I protest this coordination decision. If indeed it will take place, it will mean the loss of the only remaining "simplex" frequency we have in Pittsburgh. As you are aware, there are only 4 possible channels we can use for ATV. There is a very active ATV repeater on 439.25 in and 425.25 out. This repeater is full duplex and has extremely good coverage in the Greater Pittsburgh area. My location some 30 miles North East, receives a P5 image with full burst. There is another repeater using this pair that is some 50 miles South East of Pittsburgh. It also uses the same split, however, it is vertical polarized. This repeater does not interfere with Pittsburgh. I have seen signals from the Uniontown group at my location. This adds up to two ATV repeaters inside a 70 mile circle. A third repeater would be added interference. It would be in line of site with the present repeater and has been planned to locate only 12 air miles from this already active ATV system. Please note that there are only 15 known ATV Amateurs in Pittsburgh. I know of only 6 who are active regulars. There would be no value for another repeater and greater, a loss for the "simplex" operators like myself.

I request that you ask for a coordinator hearing on this matter. Get second opinions from other ATV operators. I have seen some coordination examples in this area that have not considered the Pittsburgh Amateurs' best interest. This proposal would be another! The person who asks for this coordination now operates several repeaters in this area. He has been known to sacrifice the best technical operations for expense. I will not allow my interest in Amateur Television to be threatened by another poor coordination decision.

You must investigate this matter. I have been an Amateur operator for 35 years. My concern is only for the welfare of the Amateur fraternity. Please do not let this matter go without question.

Sincerely, Terry A. Churchfield, K3HKR, 258 Roberts Road, Pittsburgh, PA 15239

ATV "L" - BAND FILTER (1250 - 1300 MHz)

By, Dave Clingerman, W6OAL

FILTERS! Almost as controversial a subject as Antennas, and just as many types. All of them have a specific purpose. Just for a superficial review of filter basics, let's take a look at these devices as encountered in RF work. The Low Pass we use to pass the frequencies below a certain limit and discriminate against the high frequencies. The High Pass is just the opposite, discriminating against the lower frequencies passing the ones above a certain limit of "knee" of the cut-off curve. For ATV we generally want to pass a band of frequencies and therefore we use the device first mentioned, the Band Pass filter. This type of filter has two knees, one at the lower limit and the other at the higher limit. Or, as in the case with a stripline type of Band Pass filter that has a Gausian shape, the -3 dB points are used as the upper and lower limits. These limits are established by several pairs of poles as with a stripline design, or multiple elements as with an interdigital design depending on how steep we wish the skirts or sides of the band to be passed.

Designing a filter for use at "L" band, I personally like to consider the half wave stripline filter or maybe even a quarter wave cavity type. Modeling these filters heuristically can lead one down a primrose path quite quickly as a simple stripline intuitively looks, at first glance, like a third order or three pole filter; however, when mathematically modeled as a three pole it becomes blatantly obvious that we have modeled a low pass filter. We know that it isn't right and regroup. Remember that under frequency transformation there are changes that occur in the network elements. An inductor, to RF, looks like an inductor and series capacitor. A capacitor looks like a capacitor shunted by an inductance. All of a sudden you have a sixth order network and consequently a band pass filter.

A band pass filter (for 1253-1260 MHz) is easy enough to design and construct using a few rules–some–thumb. Since the frequency on the high side is a wave length of 23.8 cm and an estimated velocity factor for the material of the stripline is around 0.95; a half wave stripline length is approximately 4.5 inches (a standard dimension for aluminum chassis). As can be seen, if we were to have elected to adopt a quarter wave cavity design, it would be rather small and could require a few machined parts, fine if you have a lathe and mill available to you.

We can start then with a standard aluminum box of dimensions, 4.5 x 2.0 x 2.0. Use a half inch wide piece of 0.063 thick aluminum or brass, add a quarter inch on each end of the box length dimension and obtain a 5.0 inch length of stock dimension. Bend the extra quarter inch at each end to 90 degrees, drill a #6 hole in the center of these tabs. Also #6 holes are to be drilled in the centers of the box ends. Mount the stripline in the box with #6 hardware using a #6 - ½" long solder lug for a lock washer. Allow the solder hole of the solder lug to point toward one side of the stripline at one end and the opposite side at the other. Make sure the stripline is parallel to the top of the "U" shaped box section.

Construct a 0.75 inch diameter disc of 0.063 or 0.035 copper or brass sheet. Place a #6 hole in the center of it. Acquire a half inch diameter ceramic coil form with powdered iron slug through the employment of a smashing tool, crush the slug and you have a screw assembly with bushing that will fit a quarter inch hole. Solder the brass or copper disc to the end of the tuning screw that is not notched. Drill a quarter inch hole in the center of the top of the "U" shaped box half and mount the screw/bushing/disc assembly. Also, in the top of this "U" section, drill (on opposite edges of the stripline edge location) two - 0.375" holes, ½" in from the ends. Mount two BNC connectors.

Make two - 1.0 inch "L's" of #14 copper wire, (0.5 x 0.5 inch). Align the wires to reside within a quarter inch of the stripline edge. Solder the wires to the BNC center pins and the solder lugs solder holes. Install the cover, securing it with four screws (provided).

Start the tune up procedure with the drive screw of the screw/bushing/disc assembly all the way out the top of the box/chassis. Supply the filter assembly with a low power, 50 ohm, RF source, at the frequency of interest, through an VSWR/Power Indicator.

L BAND FILTER DESIGN AND CONSTRUCTION

Load the opposite end of the filter assembly with a 50 ohm load. In the calibrate position of the VSWR Bridge, maximum sensitivity, tune the screw for maximum signal, reducing the sensitivity as the meter acquires full scale deflection. When the final maximum is reached, adjust the sensitivity for a meter indication at the 'cal. set' position and switch to the 'read VSWR' position. Check for loss through the filter by placing the 50 ohm load on the VSWR meter and measuring the power into the load and power through the filter. The difference will be the insertion loss. It should not be more than 1.0 dB (typical 0.6 - 0.8 dB).

You can tune up the filter also using a sweeper/spectrum analyzer combination or automatic network analyzer, whatever you have available. Place the filter between antenna and ATV converter, watch those worms and intermodulation products go away.

The repeatable results I have acquired are as follows: Insertion loss, -0.86 dB
Bandwidth (-3 dB points), 23.9 MHz
VSWR @ center frequency, 1.12:1

This filter is bi-directional and also it can be used not only for receive filtering but on a transmitter to keep the harmonics down and spurs in your own shack. I would trust it to handle around 100 watts safely before it might start to glow. Good luck. 73!

This project is available from Olde Antenna Lab. see ad this issue.

SIXTH ANNUAL ATV DINNER

Midwest ATV'ers are invited to the 6th annual ATV dinner and holiday festival, at the Ariston Restaurant in Litchfield, IL, November 28, 1992. Get acquainted hour 5 PM, dinner at 6 PM. Talk-in 144.34. The event features a swap table, many door prizes, interesting conversation and good food.

The menu includes your choice of prime rib, New York strip, fried chicken, pork chops, salmon, all at reasonable prices. Several inexpensive hotels are nearby for over-night stay is desired. RSVP is requested. 73 Scott K9SM, 907 Big Four Ave., Hillsboro, IL 62049

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FL407 INTERDIGITAL FILTER

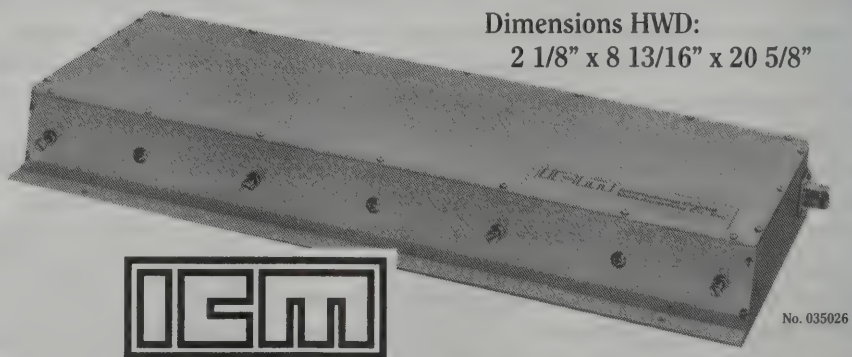
7-Pole Interdigital Vestigial Sideband Filter for Frequency Ranges of 420 MHz to 440 MHz

Ordering Information: The FL407 may be ordered on any frequency between 420 and 440 MHz. Please specify video carrier frequency when ordering.

Dimensions HWD:
2 1/8" x 8 13/16" x 20 5/8"

The 6 MHz nominal bandwidth and low loss design are perfect for transmitter or receiver use. Two filters can be used for repeater applications.

Heavy duty construction insures stable operation and long life.



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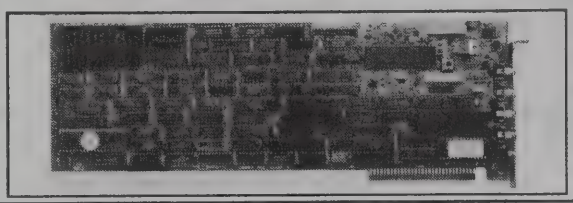
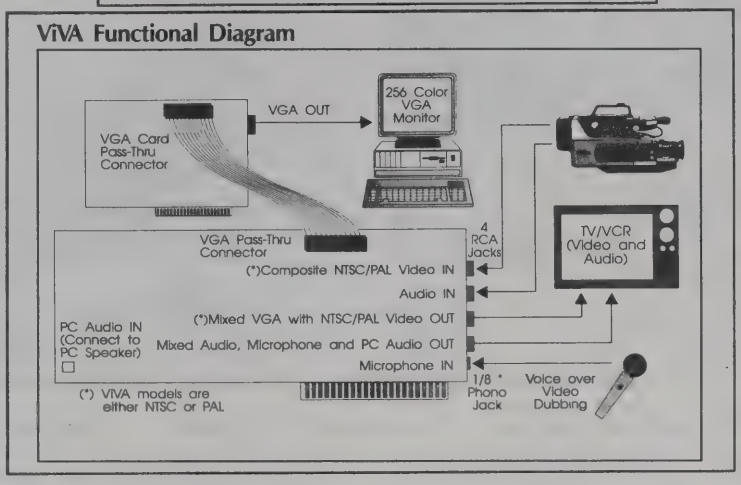
ATV MULTIMEDIA

I am sure that we have all seen or possibly even have one of those "special effects" boxes that go in between your camera and your TV or transmitter. You know the one, the box that produces diamond patterns and the waves that forever roll across the TV screen. I think everyone has seen this device or a similar one, but today in the world of electronics, far more advanced products have emerged. With the coming of the affordable computer, there has also come a revolution in the way that electronics manufactures do business with the little guy, you and me. This is most evident in the now highly affordable ATV transmitters and receivers as well as the personal computer market. It only costs a little more now to become an active ATV'er than it does to become a HAM. Thanks to this electronic revolution a new generation of video products have been born... multimedia!




ViVA Functional Diagram
VGA OUT
256 Color VGA Monitor
VGA Card Pass-Thru Connector
VGA Pass-Thru Connector
4 RCA Jacks
TV/VCR (Video and Audio)
(*)Composite NTSC/PAL Video IN
Audio IN
(*)Mixed VGA with NTSC/PAL Video OUT
PC Audio IN (Connect to PC Speaker)
Mixed Audio, Microphone and PC Audio OUT
Microphone IN
1/8 " Phono Jack
Voice over Video Dubbing
(*) ViVA models are either NTSC or PAL

To an ATV'er, multimedia has got to be one of the most exciting things that has happened since ATV's conception. The idea of using a computer in conjunction with full motion video is amazing. How can a computer that can barely keep up with your typing and spreadsheets be able to capture and process so many video frames per second? Anyway, the products are available, and perform better than most would expect. First came the black boxes that converted VGA to video and just did a fair job. Then came the video overlay boards. They were able to take a VGA screen and put it on top of a video signal and produce a video output that included both the VGA and the underlying video. And now the next logical step has been taken. By including the VGA to video converter, the VGA overlay, and adding a three channel audio mixer, a complete multimedia board has hit the market... the ViVA! For any ATV'er who wants to use their PC-AT for special effects, animation, scrolling text or just plain fun, the ViVA should suit your style. After spending some time with the manufacturer of the board, and playing with the ViVA, I would like to pass on my experiences of this new product now available to Amateur Television.

Pictures of the ViVA and a functional diagram of how the board is connected are shown in figures 1 and 2 respectively. The ViVA accepts input from a composite video source such as a camera, camcorder, or ATV receiver. There is also an input for the camera or receiver's audio. The VGA data is obtained from the VESA standard feature connector on most 8 and 16 bit VGA cards. There are two additional inputs supplied for audio, a 1/8 inch phone jack for a microphone, and a connector for your PC speaker output. The two remaining connectors on the board are outputs: one for the mixed NTSC/PAL video signal, and the other for the mixed audio.

The first question most people ask when considering a board of this type is: What hardware and software do I need to support it? More specifically, most people want to know about compatibility. The ViVA is a PC-AT single board that requires at least an 8-bit expansion slot. It fully supports all IBM PS/2 VGA modes with 256 colors at resolutions up to 640 x 480. Since the VGA data is taken directly from the VGA card, the monitor type is not important. As far as software support, the ViVA works with any VGA display compatible package. Packages such as Autodesk Animator, AutoFlix, and AutoShade can be used to produce images for use with the ViVA.

The ViVA has several features that you will not find on other similar boards such as panning, which allows the user to move the VGA image on the video output in either the X or Y direction. The ability to zoom the VGA image on the video output by a factor of 2 is also provided. One of the nicest features of this board is the ability to select the color-key as any one of 256 colors defined in the color palette. The color-key is the color on the VGA screen that will be replaced with input video when the VGA and video signals are merged. For example, if your color-key was set to black and you were looking at a completely black VGA screen, only video would be displayed on the output. If you saw a red ball in the center of your black VGA screen, the output video would have a red ball in the center of the input video. All of these functions and more are supported through a TSR program that is supplied with the board. Other ATV'er utilities are also provided such as a program that will display your call sign at regular intervals.

Setup and configuration of the ViVA was simple. The documentation provided was clear and easy to follow. Even if you do have any problems the company (LAZ Technologies) selling the ViVA provides free technical assistance and will answer any question that you might have regarding this product or other multimedia products they carry. This is a high end multimedia board from a manufacturer who provides the graphic boards for the space shuttle simulator. You have no fears of getting a home brew board. The board is priced less than $700 and information can be obtained from LAZ Technologies, 16100 Space Center Blvd. #1001, Houston, Texas 77062.

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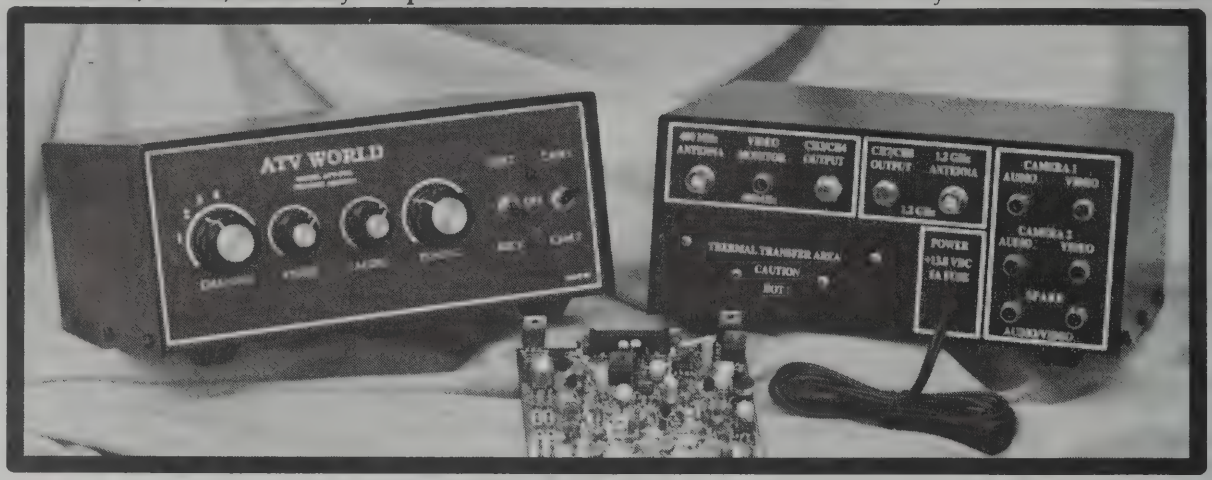
ATV TRANSCEIVER ATV-5TR

SINGLE BAND TRANSCEIVER $399.95
Assembled, Tested, and Ready to Operate !

10 WATT P/P RF OUTPUT !

DUAL BAND RX TRANSCEIVER $489.95
Choice of Red or Gray Front and Rear Panel !



RX-4-U	69.95	450 MHZ CONVERTER, RELAY, VIDEO MONI, CH. 3/4 OUT	UNASSEMBLED
RX-4-AT	89.95	450 MHZ CONVERTER, RELAY, VIDEO MONI, CH. 3/4 OUT	ASSEMBLED AND TESTED
RX-9-U	69.95	900 MHZ DOWNCONVERTER CH. 7/8 RF OUTPUT	UNASSEMBLED
RX-9-AT	89.95	900 MHZ DOWNCONVERTER CH. 7/8 RF OUTPUT	ASSEMBLED AND TESTED
RX-1-U	69.95	1200 MHZ DOWNCONVERTER TO CH. 7/8 RF OUTPUT	UNASSEMBLED
RX-1-AT	89.95	1200 MHZ DOWNCONVERTER TO CH. 7/8 RF OUTPUT	ASSEMBLED AND TESTED
RXO-X-U	29.95	CRYSTAL CONTROL OPTION FOR 1200,900,400 Mhz RX's	UNASSEMBLED
RXO-X-A	39.95	CRYSTAL CONTROL OPTION FOR 1200,900,400 Mhz RX's	ASSEMBLED AND TESTED
TX-4-U	159.95	4 CH. 10 W. CRYSTAL CONTROL TX WITH ONE FREQ.	UNASSEMBLED
TX-4-AT	189.95	4 CH. 10 W. CRYSTAL CONTROL TX WITH ONE FREQ.	ASSEMBLED AND TESTED
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CB-HP	24.95	CABINET HARDWARE PACKAGE - SWITCHES, POTS, ETC.	BAG OF PARTS
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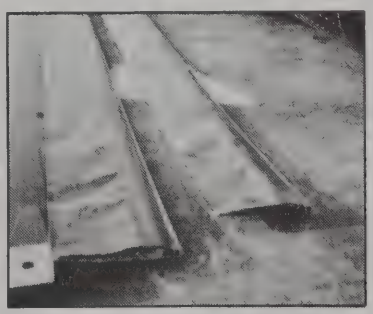
ATV'ER CRASHES COPTER

Two well known hams narrowly escaped injury when the helicopter they were in crash landed during a demonstration. Tom O'Hara, W6ORG, well known ATV'er and owner of PC Electronics, a manufacturer of ham TV equipment and his passenger, ARRL manager of Educational Activities Dept., Rosalie White, WA1STO, crash landed in Tom's F28C Enstrom helicopter on 20th, 1992.

According to reports, Rosalie, who is taking flying lessons in a Cessna 152 fixed wing aircraft was interested in the experience of autorotation which is as exciting as stall recover practice in a fixed wing aircraft. Always willing to oblige, Tom attempted a power off, autorotation landing at a practice area a few miles east of Arcadia. The area is a flood retention dam which is used as a combination helicopter practice area and public recreation area.

As Tom explained the event which he says lasted only 3 seconds after initial impact, the Enstrom landed tail rotor first. The loss of the tail rotor caused the torque to whip the craft around three times before Tom was able to cut power and "jammed in to the ground." Tom's 7 years experience flying the craft came in handy to prevent a tip-over and possible fire.

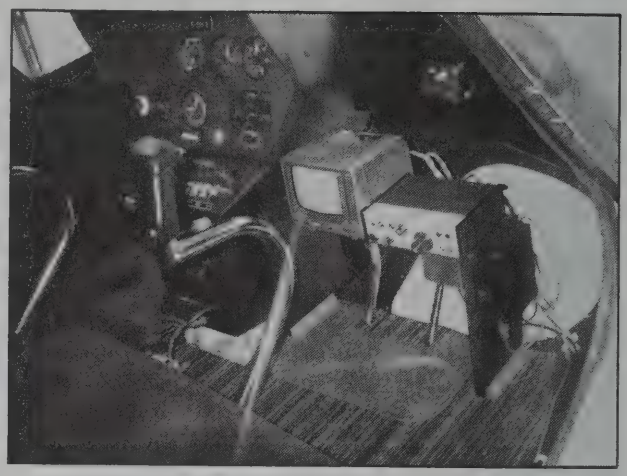


The event was admittedly pilot error in not taking fully into account the over 100 degree temperatures which reduce ground effect and flair out of all aircraft. Tom will have to take a flight review by FAA rules.

The Enstrom was formerly used in the TV series "Magnum PI" and was still painted in the distinctive colors used in the TV show. Tom had been owner of the craft for 5 years. The $65,000 aircraft is now available as used parts at great savings to the purchaser!

The photos show the damage. The rotors were removed for transport back to the home base airport.

COPTER CRASH



The tips of the rotor blades were de-laminated for about a foot making them unrepairable. The tail rotor is totaled. The cockpit view shows the ATV gear, TV set, transceiver and 15 watt amp.

Rescue was made possible by a 1282 MHz. HT which was the only working radio after the crash.

The helicopter was used for several ATV events including video transmissions for the Pasadena Rose Parade and west coast Balloon recovery and other events in the LA area. The aircraft usually had on-board ATV camera and transceiver and VHF/UHF FM mode ham radio equipment which had been removed for a recent annual inspection. Otherwise we might have had the exciting event on video via the ATN TV repeater system! We'll have to ask for a Hollywood "re-enactment" ala CBS!

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VS-100 ATV REPEATER CONTROLLER
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VS-100 ATV REPEATER CONTROLLER
Remote Video Switcher

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ATV NEWS

LOW COST HDTV TV SET

When HDTV TV sets were first introduced in Japan a couple of years ago they sold for the equivalent of $33,000. Earlier this year there was an announced price reduction to $12,000. Today, $1768, will not buy you a Sharp 28" wide vision TV set with built in satellite TV tuner! A full HDTV spec set will sell for $9433, suggested retail by the end of the year. Sony also announced they would introduce a 3 CCD chip High-8 video camcorder , the Pro CCDVXII for only $2751. The unit features 12X zoom and 380,000 pixels. Only 3000 units are to be produced and sold in Japan.

HDTV TESTS

The first results are in and the "cliff" effect of HDTV is clearly evident in FCC/AD-HDTV tests. The 16QAM system has a 1 dB range between full picture and no picture (excessive bit error rate, and the 32 QAM shows the same effect plus an additional 3 to 4 dB of signal level (less range or more signal required) for the same results.

Meanwhile, at NBC TV Washington, DC, an over the air test using real life situations, antennas at home roof level, not 200+ feet, typical home antenna, not 4 matched CATV cut channel yagi's, showed perfect pictures of the AD-HDTV system up to 70 miles away. In side by side comparison, the UHF HDTV signal, using lower transmitter power and lower antenna was perfectly received while the channel 4 NTSC signal was not visible!

The AD-HDTV system places the critical data near the channel center, away from the NTSC carrier located 1.75 MHz above the channel lower edge. THis reduces interference to/from NTSC for HDTV signals.

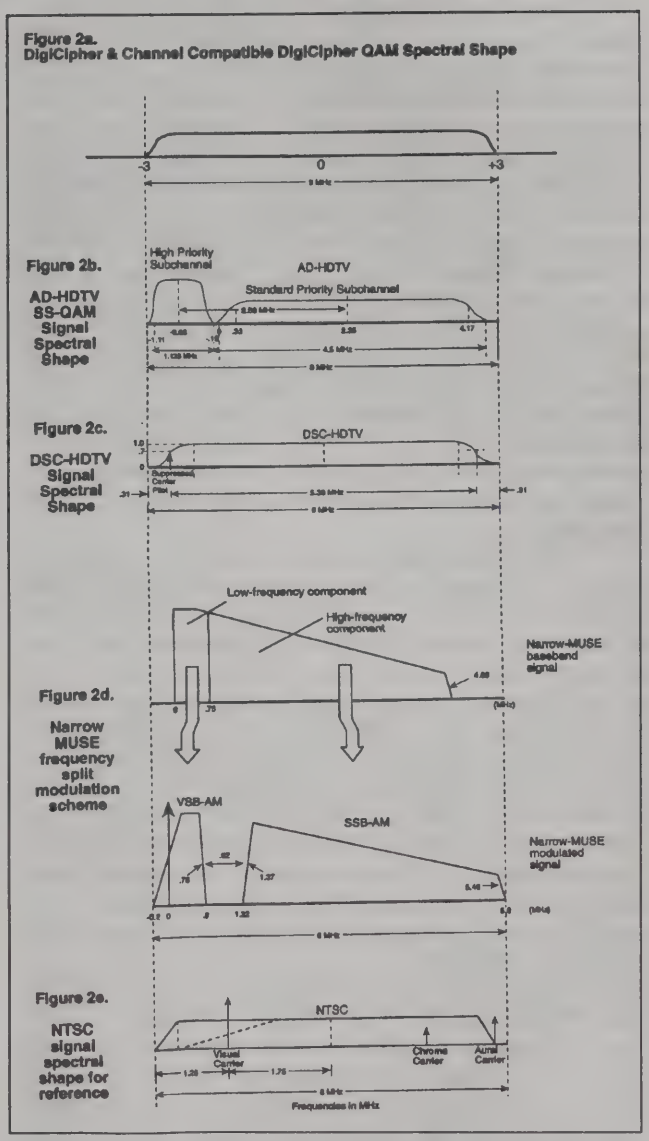
292 PAGES
NONE BIGGER - NONE BETTER!

Those who were waiting for ATV Secrets Volume II are waiting no more! When finally assembled the book came out to 292 pages. This is more than any other ATV book ever published and represents a leap forward in ATV. The book, TV Secrets Volume II, features over 90 projects and technical topics by more than 40 authors, providing an in depth coverage of all aspects of the hobby.

QST REVIEWS ATVQ BOOK
ATV SECRETS vol I

October 1992 QST contains a glowing half page review of ATV Secrets Vol I, for Aspiring ATV'ers. This book continues to sell well and has now been exposed to a much bigger audience. The issue of QST also contained good introductory article about ATV which also listed our new book TV Secrets Vol II as a reference. League sources indicate that QST will feature more ATV articles in the near future. ATVQ is a source of some material to be published in QST shortly.

ATVQ welcomes the change in QST editorial direction and thanks Brian Battles and QST for the fair, honest and glowing review of our products.



ABOVE: Spectrum of the various HDTV proposed systems. Diagram courtesy *TV Technology*

The current time table is: The FCC is to select an HDTV system in early 1993 and Broadcasters are to begin license application in late 1993 with the first HDTV stations to begin operation in 1996 with NTSC stations to cease broadcasting in 2008. HDTV is to replace all NTSC televison for cable and broadcast in most countries by 2010. It is the system of choice for direct satellite systems which are already in operation Japan plans to replace their operating first generation analog HDTV system with a 2000 line digital system.

NEW WHEEL FOR 70 CM ATV

By David A. Clingerman, W6OAL

The "Little Wheels" have been in production for a couple of years now, and have undergone various simple refinements. I have passed these refinements along to interested parties as helpful hints, and the sort of performance one should expect from the incorporation of them. As we all well know, products have their usage limits; however, it never fails, any product that can be used in a manner other than intended, or submitted to an environment more harsh than common sense might dictate, will be. In some cases, the product will be over stressed, in some way, that will cause it to disintegrate. During my many years in the Navy, we used to require vendors to produce equipment that was Sailor Proof, indestructible, for these very reasons. The expectation that the customer will "read the fine print" and the "caution(s)", many times read too late, to save the equipment. There are many instances where just plain common sense will suffice. Otherwise, you may find that vendors will just blow you off if you even think of over stressing or using their equipment in a manner other than for its intended use.

The Olde Antenna Lab has taken quite a different approach to the problem of over-used/over-stressed products, especially the "Little Wheel" that has found multi-varied application in both the Amateur and Commercial 450 MHz antenna market.

If an antenna comes back, (and there has been only one to my knowledge) looking like it was used to scramble eggs, the obvious is asked, "was it?" I have created "Little Wheels" (70 cm), "Mini Wheels" (23 cm), "Micro Wheels" (13 cm) and now the "Nano Wheels (33 cm), for use on land vehicles, boats, ships, airplanes, helicopters, model airplanes, model rockets, kites and even high altitude balloons that carry payloads to the "Edge of Space", would you believe! However, I have yet to outfit a Frisbee. I learn something every time I am presented with a new challenge.

Of course, I've learned something about ease of manufacturing along the way also. The creation of things doesn't necessarily have to be labor intensive, although you'd never know it from my machine shop or production area. Really, I am learning. My previous endeavor, in California (Antennas, Inc.), did not, in any way, rule out labor intensiveness. Maybe I'm just a hard-headed German, but I'm learning that excessive pain is not necessary in order to be profitable. I'm not a masochist and where I can save a minute here and there, I'll do it, as long as the quality of the product is in no way impaired.

With these few thoughts in mind, let me describe the "NEW WHEEL". In the past I have built the "Wheels" directly onto a coaxial connector (BNC, N, C, TNC), both male and female. At some point in time it occurred to me that if a person is going to use a "Wheel" on top of a land vehicle, some manner of device will have to be employed that will raise the radiator above the roof of the "car" greater than ¼ λ and preferably ½ λ (unless you wish to work satellites). If I were to create the "Wheel" on the end of a length of hardline, it could serve as the device that would place the radiator above the roof/ground plane, whatever it may be mounted above. Then, if so inclined, the customer could place a reciprocal fitting in the roof/ground plane to accommodate the connectored hardlines' other end. Or, a coaxial "L" adapter could be used to guide the coaxial cable at a right angle away from the array and into the vehicle at some convenient port.

The hardline was the first enhancement of the "Little Wheel" toward creating the "New Wheel". Since I use (mostly) ¼" hardline for this premier enhancement, I needed to come up with a method of attachment of the elements to the hardline. I did some experimentation with brass eyelets, soldering them to the hardline. Works fine until the elements are to be soldered to the eyelet. The solder holding the eyelet heats up, melts and the whole mess falls off the end of the hardline. Just need a better "mouse trap", I guess. Next I found a cache of ¼-20 brass hex nuts that seemed to show some promise. Not only would they slip over the ¼" hardline after being drilled through to remove the threads with an 0.250" drill, the six sides afforded me flats on which to drill three 0.093" holes. These are the holes in which the ground ends of the 1 λ brass elements are soldered. My first consideration was that this would increase capacitance and cause the array to become resonate at much lower than the design frequency. A 1" brass disc was tried with a 1" X ⅛" teflon spacer beneath it. The structure was swept with an RF Sweeper set between 420 and 450 MHz, without the capacitive stub in place. It looked just as inductive as the previous models. I doubt that the new mechanical arrangement contributed 0.5 pF more than before. The advantage was a much larger area on which to solder the element ends and it makes the structure much stronger mechanically. The center conductor of the ¼" hardline is healthy, (approx. 0.060). If the radiator (antenna) end of this center conductor is placed through a 0.060" dia. hole in a brass "top plate" and bent into a loop or "U", the "top plate" won't come off even if the solder joint, at the hot end, of the cloverleaf elements break. As an added measure of precaution, this became a part of the third enhancement in the creation of the "NEW WHEEL". The capacitive stub (<¼ λ length of 0.3" x 0.064" brass stock) was installed and the elements adjusted while on the sweeper. Tuning was still possible from 420 MHz to 450 MHz. Please consult with me, on the phone or in writing, for other types of connectors or alternatives.

I guess now we can say of the "NEW WHEEL",
--BUILT LIKE A BATTLESHIP!

THE INDIANA AMATEUR TELEVISION AND UHF CLUB NEWSLETTER

By Don C. Miller, W9NTP

Chuck Crist, WB9IHS, showed the tape of the 500 Parade that several hams participated in this year. He discussed how ATV hams were able to provide assistance to the parade. N9HLL, Rick, came down from Lebanon to assist Malcolm, Paul and others who helped. This is one thing that ATV hams can do to provide public awareness of our worth.

Jack Ballentine, W9ETI, from Anderson has been very busy during the last few years building bigger and better ATV transmitters. He has a late model that uses tubes and really looks like a fine piece of equipment over the air. We need more high power ATV transmitters on the air. Even though repeater ATV is fun and informative, there is little possibility of working great distance during a band opening. Long distance ATV DX is made possible on a regular basis if the power is increased. We work Dayton, Cincinnati, and Columbus, Ohio almost every day during the summer. Pictures this morning were over P3.

While we are on the subject of DX, 1280 MHz FM ATV works very well too. Recently I, W9NTP, and the group around Dayton exchanged ATV pictures on 1280 with strengths up to P5. If you are interested in getting a system going on the 1200 band you can check out your system by tuning to a beacon on 1290.52 MHz. It is located in Ohio on a bearing of 90 degrees from Waldron. It seems to come in every day. I wish that we had an input on the Indianapolis repeater for 1200 FM-ATV. Wyman Research will donate a receiver if anyone is interested. The polarization should be horizontal. This may be a problem since I know of no good high gain horizontal 1200 antenna.

Larry Oaks, WB9YAJ, arranged for this subject. You may have heard Ron Pogue, KD9QB, talking with John Haskell, KB9CML, on 144.34 MHz concerning the transmission of pictures over one of the Pak-Sat satellites. Ron is the Regional AMSAT Coordinator and John is the Area AMSAT Coordinator. There are two satellites that are capable of image transmission. These are AO-16 and UO-22. The first is capable of 1200 baud and the second is capable of 9600 baud. John is in the medical equipment business and has been digitizing X-ray pictures for transmission. In order to transmit pictures, data must be formatted. Recently there has been lots of discussion of the JPEG method of data compression. Ron discussed both JPEG and GIF formatting. John is giving one of the main talks on Pak-Sat image transmission at the AMSAT meeting at Lafayette, on Saturday, June 13.

Ron will also give us the latest details on how to work these Pak-Sat satellites. I became interested in Packet satellite transmission when I kept hearing packet on the Russian MIR satellite on 145.55 MHz when I was trying to hear our own shuttle on the same frequency.

The latest shuttle will have ATV on it. There will also be slow scan and ham radio operation. The ATV must be done with designated stations that have received a Special Temporary Authorization, STA, for that purpose. Apparently this is needed for transmission of television from the Earth to a satellite. I had never heard of this before but I talked to the amateur in charge at Dallas last weekend and he confirmed it.

Our meetings have a homebrew contest. I feel that this is very important to our club. Most hams like to see the individual efforts of the experimenters even though they might not be builders. If you have built something, even though it might not be for ATV, bring it to the meeting. George, W9VMT, gets our prizes and arranges for the judging. Many of our older amateurs make the excuse that the meetings are too sophisticated for them. I assure you that if we have good homebrew displays that they will be there to see what their fellow hams have built.

ED NOTE:

The club meets three times a year and draws ATV'ers from several states for each meeting. For information, contact Don Miller W9NTP. These meetings are well worth attending for any ATVers within traveling distance. They are on Saturday nights, usually starting at 7 PM at the Indianapolis Power and Light office just off I-70 in Indianapolis.

SEE CONTEST ANNOUNCEMENT

1992 INDIANA ANNUAL ATV CONTEST

Sponsor: Indiana Amateur Television & UHF Club

Purpose:(1) Promote technical advancements in amateur television and UHF communication area of the hobby.
(2)Provide a recognition program for amateur operators in the area of fast scan television communications.

Rules:

(1) Object - To work as many Amateur Fast Scan Television contacts as possible on frequencies of 420 MHz and above.

(2) Contest Period - Begins 0500 UTC November 1, 1992 and ends 0500 UTC December 1, 1992.

(3) Categories -

A - Class I power - less than 5 watts
B - Class II power - 5 to 34.9 watts
C - Class III power - 35 to 99.9 watts
D - Class IV power - 100 watts or more
(Power for this contest shall be the transmitter output peak power amplifiers included.)

(4) Exchange -

A - Only confirmed 2 way television contacts of 10 statute miles or more shall be eligible. (EXCEPT CLASS I. NO MILEAGE RESTRICTIONS.)

B - No repeater or balloon or airborne equipment contacts shall be allowed for this contest.

C - Contacts must be confirmed by LOG SHEET ENTRY with following data: 1) Call contacted, 2) QTH contacted, 3) Distance in statute miles: Dist. will be checked by rules committee using LAT/LONG computer calculations, 4) Picture rating (P2, P3, etc.) no sync. bar reports allowed, 5) Power used for contact, 6) Time (UTC) and date of contact, 7) Freq. of contact (please provide your LAT/LONGs if you can).

(5) Scoring -

A - 1 Pt./each statute mile between confirmed contacts.

B - Points shall not be given for Dupe contacts in same amateur band.

C - Only confirmed amateur television contacts shall be considered.

D - CONTACTS ON SEPARATE BANDS WILL BE COUNTED.

(6) Reporting -

A - All entries must be postmarked no later than DECEMBER 15, 1992.

B - No late entries will be accepted.

C - Mail entries to: WB9IHS, Chuck Crist
6455 Madison Avenue
Indianapolis, IN 46227

D - All entrants must include home phone number.

E - Contest log sheets are available; send SASE to WB9IHS

(7) Awards - Separate awards shall be given, one for each category, for the most points scored in each category.

A - Class I power
B - Class II power
C - Class III power
D - Class IV power

A separate award shall be given to the amateur that makes the longest contact, regardless of class entry.

(8) Condition of Entry -

A - Each entrant agrees to be bound by the provisions, as well as the intent of this announcement, the regulations of his or her licensing authority and the decisions of the contest rules committee.

Rules Committee:

W9DUU, Paul Bohr
WB9IHS, Chuck Crist

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P.C. Electronic pioneered the ATV transceiver in 1977 with the 10 Watt TC-1. While the change in 1985 to the 1.5 Watt units gives the flexibility of selecting 15, 50 or 70 Watts depending on the situation, many long time ATVers said they missed the old 10 Watter which did just fine in most cases for local and repeater use - *90 miles snow free line of sight using 14 dBd beams. You've always been able to build your own 10 Watt system from some of the basic modules on page 2 (TVC-2G, TXA5-70, FMA5-F and PA5), but now we have a ready to go alternative in a rugged die cast aluminum box.

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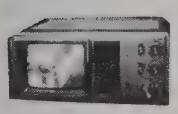
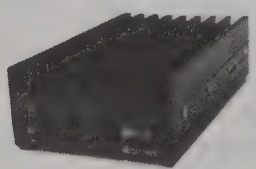


Your TV set

+

+



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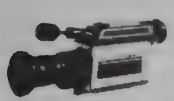

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KLM 440-6X 8.9 dBd $60
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Remember when comparing prices, ours include UPS surface shipping.

5/92a

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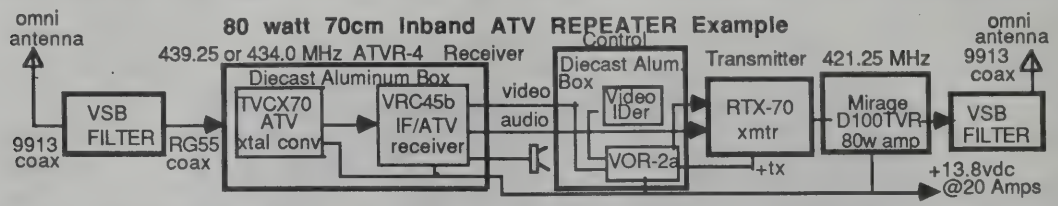
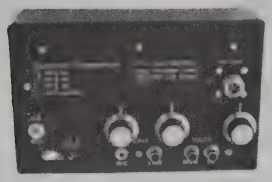


Select an RTX Transmitter and a ATVR Receiver for the bands you want, add the appropriate linear amp,VSB filters & antennas, ID & VOR-2a, power supply and coax for your own repeater. We suggest low in / high out for crossband. Ask for a copy of our ATV Repeater article before you start so you will do it right the first time. Also listed are recommended sources of filters, antennas, IDers, etc. Most can put together a good working ATV repeater for under $2000.



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FP-19 Comet vertical omni10 dBd gain, 7 ft 4 in long. Covers 902-928 MHz.....**$109**
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DOWNCONVERTER DISCOUNT of 10% is available to Repeater groups and clubs if you order 5 or more per item of the tuneable downconverters Special discounts for Teacher Hams - call. The order must be sold and shipped to one person at one time. It helps to have some extras available for new people to try out your repeater or use at demos at other clubs and schools. All downconverters have a GaAsfet preamp and mixer for low noise and high dynamic range. Get a board if you want to package your own - you will need a shielded cabinet with knob, switch, connectors and 11 to 14 Vdc power supply. Or get one ready to go. **5/92**

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1992 ATV CONTEST

Contest Log Sheet

Page _____ Of _____

Call _____ Date _____

Name _____ CLASS ENTRY _____

CONTACT				DISTANCE between (statue mi.)		SIGNAL RPT (P1, P2, P3) (P4, P5)			XMTR Pout (WATTS)	TIME UTC	FREQ. (Mhz)
Date	Call	QTH	Name		Pts.	R	S				

HOME TV VIA SATELLITE

Thompson Consumer Electronics, maker of RCA and GE televisions, recently announced that it would help launch a satellite-to-home TV broadcasting system through a venture with the Hughes Electronic division of General Motors Corp. Thompson, owned by French electronics concern Thompson, SA, will make the satellite receiving dishes, TV set decoders, and other technology for the system, scheduled to go into operation in early 1994. The system, called DirecTV, will be capable of providing more than 100 channels to 18-inch satellite dishes installed outside homes.

TEST INSTRUMENTS

Bel Merit's new fall product line catalog features detailed specifications and descriptions of portable and benchtop test and measurement instruments designed for the engineer, student, technician or hobbyist who test, repair, assemble electronic or electrical equipment.

Some new product highlights include new full multi-function digital multimeters w/holster, digital clamp-on current meters, bench instruments, non-contact voltage detectors, electrical voltage testers, continuity checkers, AC circuit analyzers, oscilloscope probes and more.

For your copy of this new catalog: call 714-586-3700, fax 714-586-3399 or write Bel Merit Corp., 17 Hammond, Suite 403, Irvine, California 92718-1635.

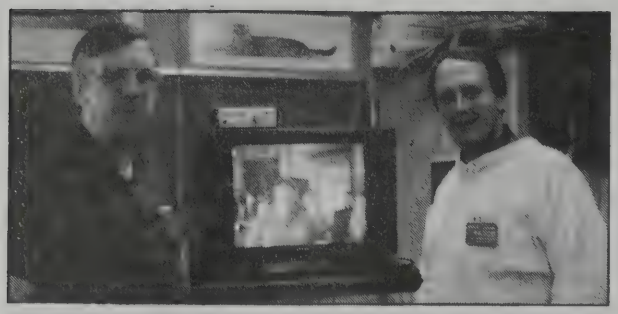
BALTIMORE FSTV REPORT

A new ATV organization has been formed in the Baltimore area. The group is called the CATS. This stands for the Chesapeake Amateur Television Society. The group is running a BBS that everyone is welcome to dial up and give a try. The phone number for the BBS is 410-675-6930 with 2400 baud 8-N-1. The CATS have their on-air meetings on Wednesday at 9:00 p.m. The video is through the BRATS ATV repeater and the audio can be found on 144.950 MHz.

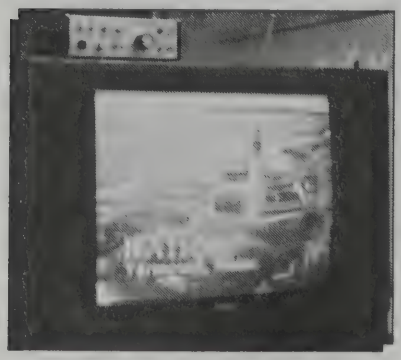
Bob Bennett W3WCQ has been appointed the chairman of the VHF-UHF Advisory Console. Bob has been a member of the Console for four years. This is National ARRL group which has 17 members. Sixteen are from the divisions of the United States and the seventeenth is from Canada. The VUAC is concerned with the spectrum use for all modes of operation on the VHF and UHF bands except for FM repeaters. Congratulations to Bob on the new appointment.

As of this writing, we have not had any other ATV ultralight flights. Work is under way for the new CCD camera and Elktronics Identification board. So far I have bread boarded a 555 timer and have it operating with the video I.D. card. The timer will switch between live camera video and the electronic ID'er. The camera video is timed for about 4 minutes and the identification lasts about 6 seconds.

Yarmouth, Maine Hamfest
ATV Demo and Balloon Flight



Last May 16th, a well-attended ATV forum was held by Mike Leonard KA1IOD during the first annual Yarmouth hamfest near Portland, Maine. The audience was entertained by live ATV transmissions being relayed from the hamfest floor back to the forum room. As a result, a good deal of interest in ATV was generated in the area. Mike put together a fast-paced and very enjoyable video demonstrating how to get started in ATV and finished up with some spectacular video QSL screens featuring callsigns of some of the local hams (potential ATVers). In addition to the ATV demo, Bill Brown WB8ELK came over from New Hampshire to launch a small beacon transmitter with a high- altitude balloon from the parking of the hamfest. Since the probability of landing in the Atlantic Ocean was very high, Bill opted to fly just two AM beacons on 2 meters (2 milliwatts) and 10 meters (20 milliwatts) modulated with a repeating message from a voice storage chip.



The crowd had a lot of fun listening to the voice downlink as the package took off (some using shortwave receivers and scanners). Even though the transmitter power levels were only in the order of milliwatts, excellent signals were received over 250 miles away on both 10m and 2m. I guess this shows that you don't need a lot of power, just a 100,000-foot tall antenna!

After a two-hour flight, the package did, indeed, splash down in the Atlantic about 10 miles from the shoreline. Hopefully, a fisherman may eventually recover whatever is left (the "Catch of the Day")!

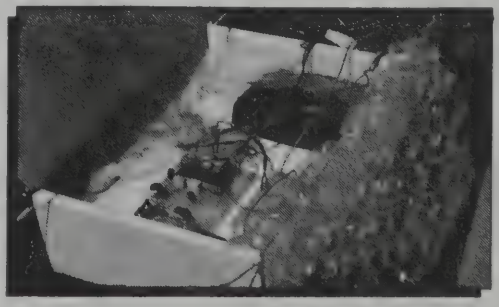
Photo TL. Paul Klebaur N1JLL and Mike Leonard KA1IOD receive a live ATV transmission from Pete Wilhelmi N1GEV, who was transmitting from the hamfest flea market area. (All photos by Martha Lostrom KA1UUO).

Photo BL. Excellent ATV QSL screens were generated via Mike Leonard's video wizardry.

Photo CR. As part of the hamfest festivities, Bill WB8ELK sent a small 10m and 2m beacon package to 100,000 feet using a large weather balloon.

Photo BR. The internal workings of the balloon payload showing the voice ID board and the 2m and 10m AM transmitters.

Photo TR. It's straight overhead! Spectators watch as the balloon payload carries its payload to the edge of space.



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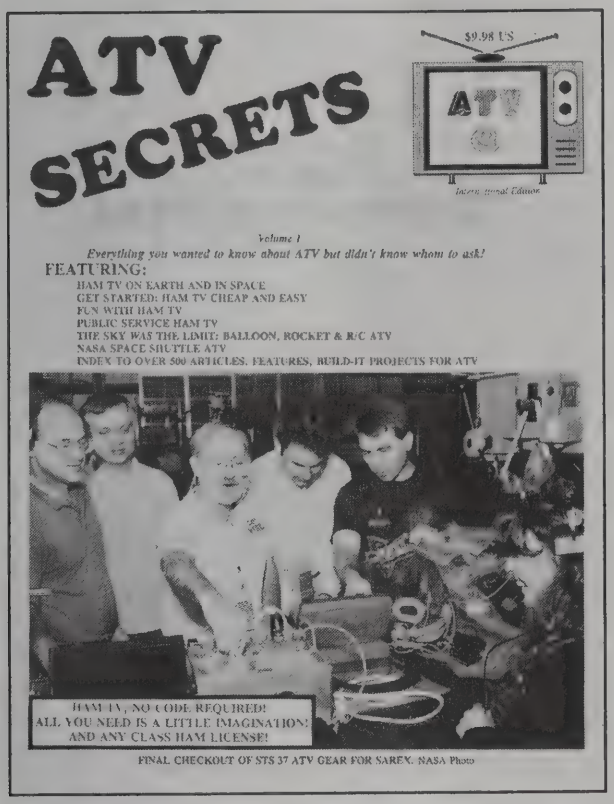
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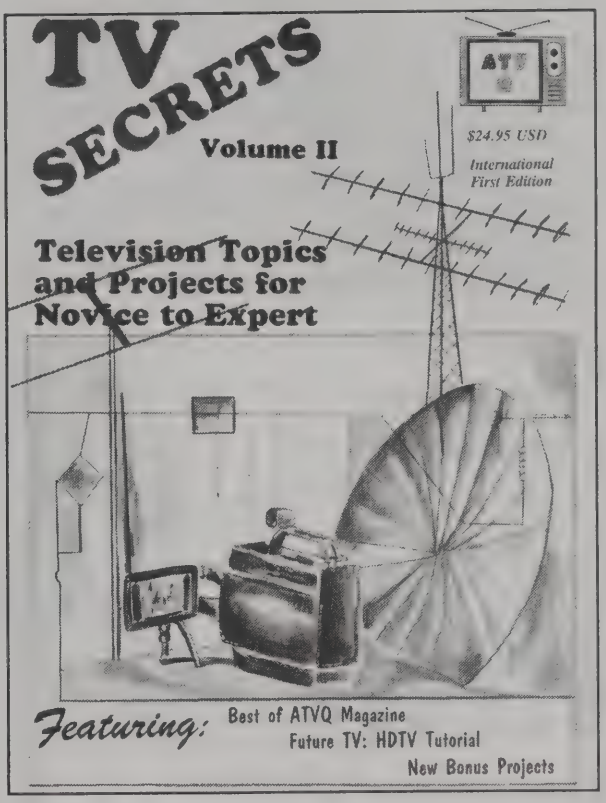

ATV SECRETS volume one, for aspiring ATV'-ers, as reviewed in the October 1992 issue of QST, is a great place to start your ATV adventure. Its 64 pages are tightly packed with succinct information to cover all aspects of getting started, where to find activity, equipment, how to DX, and answers frequently raised questions of power, antennas, vestigial sideband operation and more. It also includes an index to over 500 items which have appeared in ATVQ Magazine's first four years. From ATVQ, $9.95 plus $1.50 post (US, $1.90 (Canada) $2.90 (DX).

TV SECRETS volume two, for advanced ATV'ers, as published in the October 1992 issue of QST, is a mammoth book, with over 280 pages of technical material. Over 40 authors present over 90 technical projects and theory topics to fully acquaint anyone from novice to expert in the how and what of TV, video and ham TV. Divided into 11 chapters, the book presents tested projects for all areas of interest in ham TV including antennas, amplifiers, repeaters, receivers, transmitters, video accessories and more. $24.95 plus $2.90 post (US) $3.80 (Canada) $6.50 (DX).

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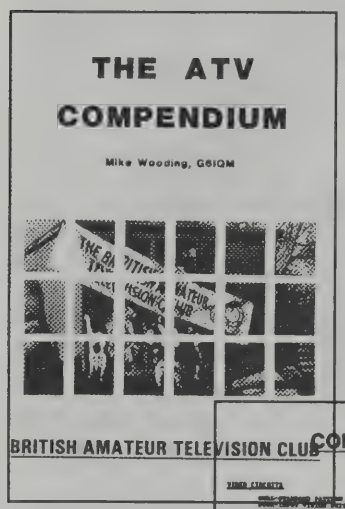

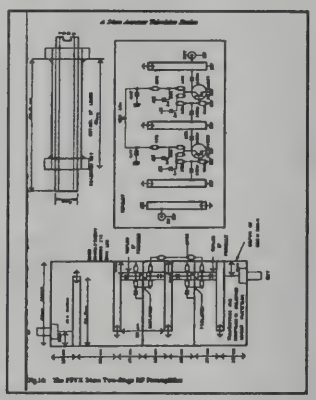

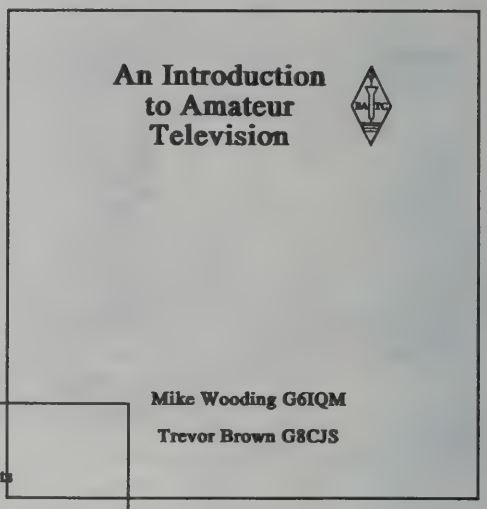

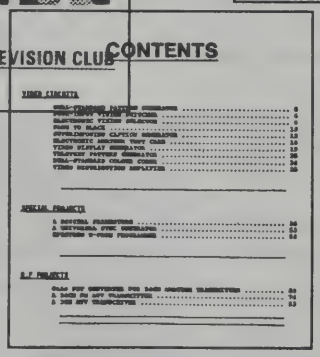

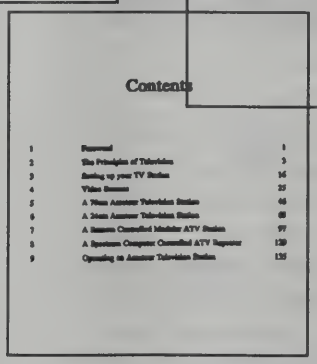

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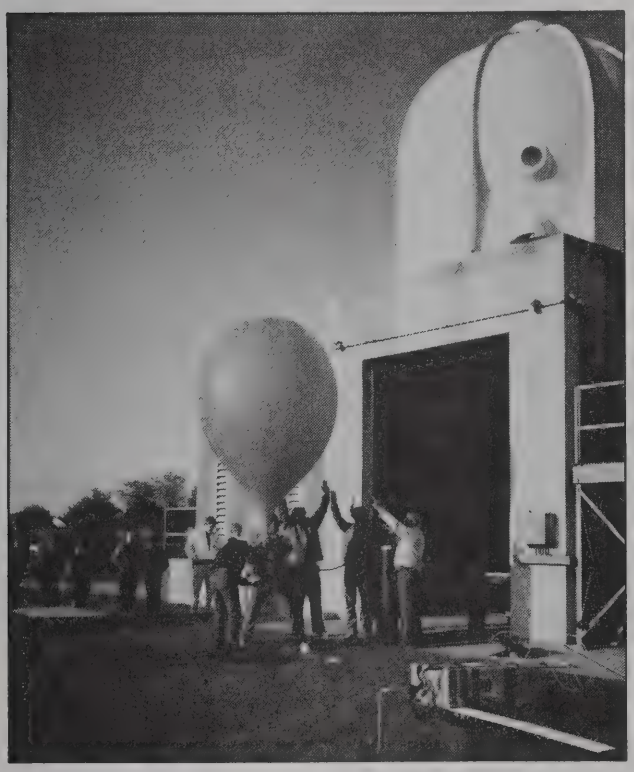
DARA PAYLOAD MEETS ITS WATERLOO OR OPERATION A SUCCESS, BUT PATIENT DIES

By Dave Pelaez, AH2AR

On 28 March 1992, at 0616 L, The Dayton Amateur Radio Association launched their third high altitude amateur



radio balloon experiment. The predawn launch occurred at NOAA's radiosonde launch site. The two video cameras automatically switched from a horizon view to a view pointing straight up at the parachute and balloon. These images were seen by many early bird ATVers out to a range of approximately 400 miles. As the atmosphere became thinner at higher altitudes, the balloon expanded to over five times its original size, and ATVers across the midwest watched the video as it attained a confirmed altitude of 105,000 feet. A simplex two meter repeater package, designed by WA8ZAH, also worked flawlessly. Surprisingly, no desense was experienced by the simplex repeater, which have plagued earlier flights incorporating on-board receivers. Although a two meter Kenwood handie-talkie was used (with limited front-end filtering), the lack of desense probably could be explained by the use of a standard "rubber duck" antenna. Seven different states could be heard checking into the simplex repeater system, and this antenna probably became the most "efficient" rubber duck antenna ever utilized.

The balloon finally burst at 105,000 feet, and the package descended about a thousand feet per minute. The Indianapolis RDF crew tried to head in on the drifting payload, but as luck would have it, the payload drifted nine miles ahead of the crew, landing in between hills located within the Wayne National Forest. The RDF crew never could reacquire the signal, because the labyrinth of unmarked roads within the forest area would not ultimately lead them close enough to the payload's final resting spot. Later that day, W9DUU, assisted by a local ATVer who owned a plane, circled the area and was able to get a bearing on the transmitting package, but none of the RDF team successfully got near enough to the payload. Further analysis of the data indicated that the package most probably fell into one of the many hollows within a two square mile area northwest of Waterloo, Ohio.

Later that evening N8ASB was able to overfly the general area, and he was not able to reacquire the signal, possibly because the lithium battery was close to its maximum milli-amp hour budget. A strobe was also on the package, but was not spotted by the aircraft recovery team. A Monday morning phone call came in to AH2AR from a citizen of Waterloo, Ohio, Tom Miller, who lives three miles from the lat-lon readings that W9DUU reported. He called Dave and mentioned to him that he found a radiosonde within a mile and a half from his house. He explained that he read the Ironton Newspaper and saw the article about the "lost" payload that came down near Waterloo. By the description of the payload that appeared in the newspaper he knew that what he found was different from the DARA launch. It appeared that the radiosonde launched fifteen minutes prior to the launching of DARA's payload had landed relatively close to DARA's predicted touchdown point. AH2AR tried to find some volunteers to go out to the site the following day, but because of the short-notice request, was unsuccessful. Opting for a Sunday recovery operation, AH2AR canvassed the DARA Club members and a total of 21 people volunteered to drive the 360 mile round trip out to the Wayne National Forest.

There appeared to be a three mile deviation from all of the data that was reported by WB8ELK's tracking program, W9DUU's lon-lat readings he had extrapolated from his flyover on 28 March, and the actual radiosonde landing point. On Saturday, 4 March, AH2AR telephoned Tom Miller (by the urgings from WB8ELK) and got the serial number of the radiosonde found by Tom. He then went to the weather station and looked up the serial number and discovered that

the sonde Tom had found actually was from a March 15 radiosonde flight from the Huber Heights launch site. Incredibly, this sonde was launched 15 days earlier and had touched down within 3 or 4 miles from the predicted touchdown point for DARA's payload. This fact explained the anomaly between the predictions, Paul's lon-lat readings, and the "supposed" touchdown point of "sonde" number one.

On Sunday, 5 April 1992, six vehicles containing 21 DARA volunteers went out to conduct a systematic search of the area. Those amateurs involved in the search were

Additionally, N8ASB conducted overflights of the area, and was able to spot objects that resembled the payload within the search area, but was not the payload.

The search concluded after many hours of cross country hiking over terrain that contained only four types of features: Up-Down-Right-Left!

The payload eluded the RDF team, 3 separate overflights, 21 volunteer searchers and one citizen of Waterloo. A standing reward of $150 is being offered for the recovery of the wayward payload. Tom Miller indicates that this area experiences heavy turkey hunting during the month of April, and he, among others, may "happen-upon" the payload that contains reward information, both internally and externally. AH2AR mentions that most of the payload contents will survive a year of weather, and he hopes a turkey hunter finds it soon!

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Gain bandwidth	420-450 MHz
VSWR	< 1.33:1 415 to 450 MHz
E-Plane beamwidth	23 Deg.
H-Plane beamwidth	24 Deg.
1st E-Plane sidelobe	-17.5 dB
1st H-Plane sidelobe	-15.5 dB
Maximum power	1500 Watts
F/B ratio	22 dB
Impedance	50 ohm

MECHANICAL SPECIFICATIONS:

Length	14 Ft.
Boom	1" od 6061 T-6 Al
Mast	up to 1.5" dia.
Wind surface area	.78 Sq.Ft.
Wind survival	90+ MPH
All Stainless Steel Element Hardware	
Coax connector	N-type
Polarization:	Horizontal or Vertical

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FO16-222, FO22-432, FO22-ATV, FO25-432, FO33-432, FO11-440
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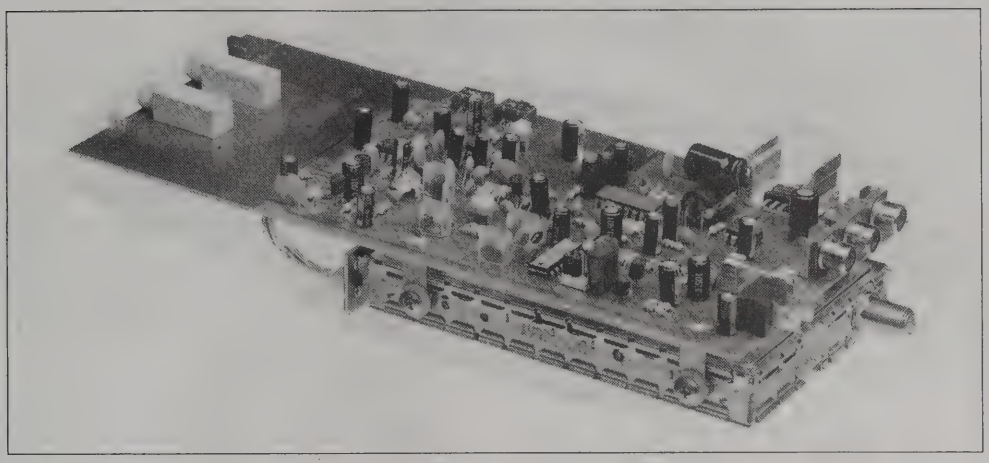

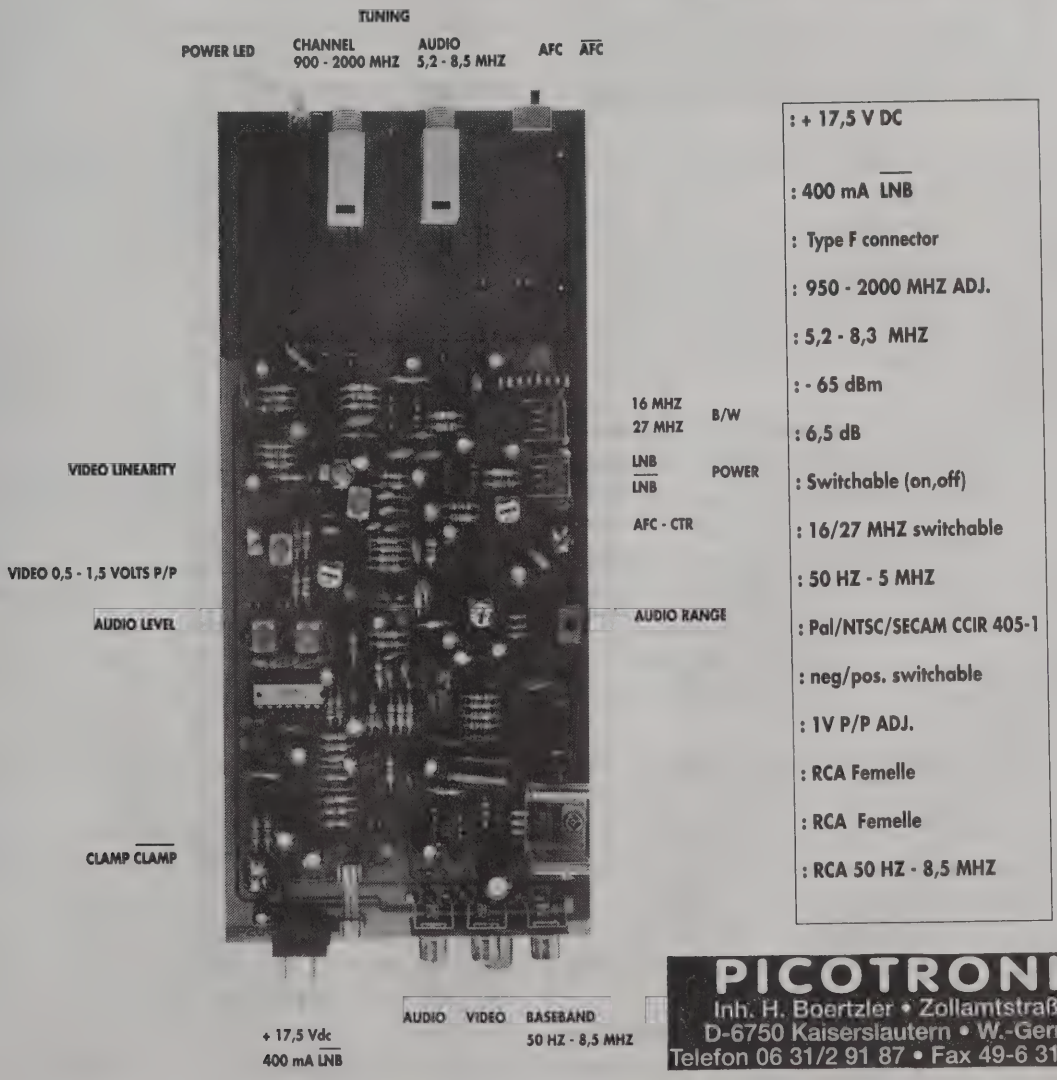

: + 17,5 V DC

: 400 mA LNB

: Type F connector

: 950 - 2000 MHZ ADJ.

: 5,2 - 8,3 MHZ

: - 65 dBm

: 6,5 dB

: Switchable (on,off)

: 16/27 MHZ switchable

: 50 HZ - 5 MHZ

: Pal/NTSC/SECAM CCIR 405-1

: neg/pos. switchable

: 1V P/P ADJ.

: RCA Femelle

: RCA Femelle

: RCA 50 HZ - 8,5 MHZ

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BUILD A 900/1200 MHZ ATV DOWN CONVERTER

Earl Campbell, KS8J

1200 Mhz sounds formidable at first glance, or so I thought. Well, with some of the new off-the-shelf UHF monolithic amplifiers, low noise GASFET's, and computer programs to model and layout circuit boards, the task of designing a circuit is not as formidable as it used to be. Presented here is a surface mount, low noise figure, high gain 1200 Mhz down converter that has a bonus!

This down converter also covers the 900 Mhz band with the addition of one cap and retuning. Sounds almost too good to be true, but Mike, WA6SVT, has achieved this and more! How's specs like <1.5 dB noise figure, >32 dB gain, and availability of an assembled and tested unit for less than $90.00 sound? Well, if this peaks your interest, read on.

Here is a description of how the circuit works: (Refer to the block diagram)

At point A in the block diagram, the typical 1253.25 Mhz ATV signal enters from the antenna. The signal is filtered by a bandpass filter resulting in a .5 dB loss at this point. A little loss here is more than offset by the fact we reject a lot of the out of band signals here.

Point C in the block diagram is the dual gate GASFET NEC-251. This device amplifies the signal an additional 17 dB for an overall gain of 16.5 dB at this stage.

In block diagram area D, a 3 pole bandpass filter is employed to reject out of band signals further. Loss here is 3 dB which is quite reasonable.

Block E shows a monolithic amplifier that increases the 1253.25 Mhz signal another 14 dB for an overall gain here of 27.5 dB.

Area F is another 3 pole bandpass filter rejecting any residual out of band signals. Loss again is a reasonable 3 dB. Overall gain is now 24.5 dB.

The local oscillator at block G is running at 1078 Mhz. This +8 dB signal is coupled into the mixer at block H to combine with the 24.5 dB received signal to produce a difference of 175.25 Mhz at a level of 17 dB conversion gain so far.

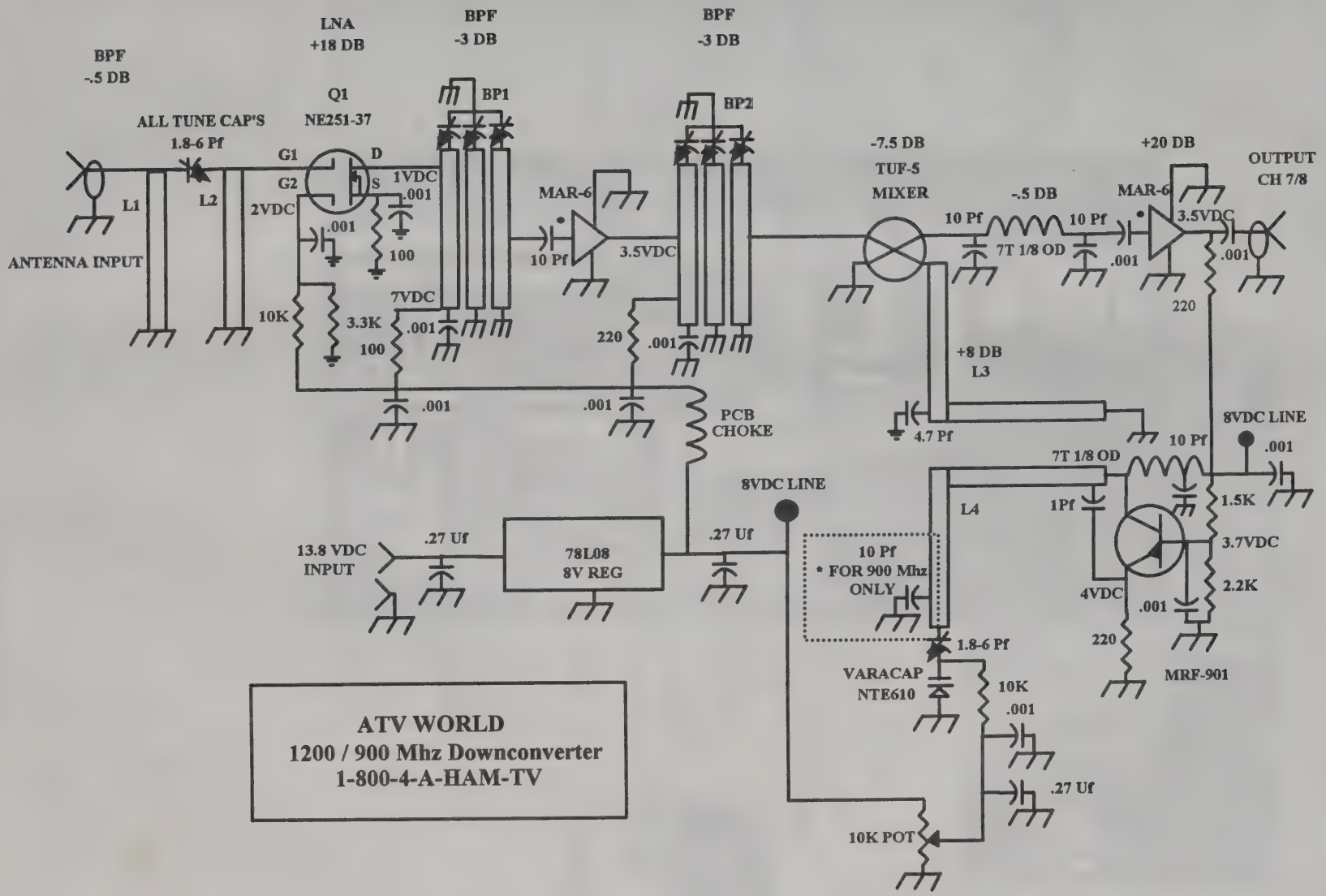
Point I in the block diagram is a low pass filter to reject any unwanted adjacent channel interference near TV channel 7. We now have a 16.5 dB conversion gain considering the .5 dB loss from this filter.

At block J, another monolithic amplifier is used to boost the signal, now converted from 1253.25 Mhz to 175.25 Mhz, by an additional 20 dB. Total overall conversion gain is now approximately 36.5 dB! At this level, even brain dead TV's come alive with the received signal.

Mike, WA6SVT, did extensive testing of the design, utilizing state-of-the-art test equipment. On the air tests were also performed with excellent results. The down converter board is broadbanded enough so that with an additional cap in the local oscillator circuit, 900 Mhz down converting is achieved with equal or greater conversion gain. Retuning will be necessary though for optimum results. He has found that a mast mounted pre-amplifier under normal circumstances will not be necessary as this down converter has plenty of front end and IF gain.

A word of caution about building this converter. The printed circuit board layout is critical and most of the parts are of surface mount design. If you have not had experience with surface mount, I would suggest getting the assembled and tested unit. A kit of parts with the printed circuit board is available also, or if you don't feel like scrounging up all the necessary parts, or if your parts box is short, consider the one source stop. The printed circuit board alone is also available.

When building the down converter, pay particular attention to the parts placement as it is critical at these frequencies. On the 3 pole bandpass filters, the trimmer caps butt right up next to one another, the outside ones at a forty-five degree angle. A little tight here, but if you use the parts specified in the parts list, they will all fit in the allotted space. Two hand wound coils will be made of #24 gauge wire, 7 turns each 1/8 inch in diameter. Bend the coil leads so as to fit the solder pads. The MRF-901 in the local oscillator has one of the emitter leads cut off flush upside down (lettering towards the board). If you install it incorrectly, you will probably not destroy


BPF
-.5 DB
LNA
+18 DB
BPF
-3 DB
BPF
-3 DB
ALL TUNE CAP'S
1.8-6 Pf
Q1
NE251-37
BP1
BP2
-7.5 DB
TUF-5
MIXER
+20 DB
OUTPUT
CH 7/8
G1
D
G2
S
1VDC
2VDC
.001
100
MAR-6
10 Pf
3.5VDC
-.5 DB
7T 1/8 OD
10 Pf
10 Pf
MAR-6
3.5VDC
.001
.001
220
L1
L2
ANTENNA INPUT
10K
3.3K
100
7VDC
.001
220
.001
+8 DB
L3
.001
.001
PCB
CHOKE
4.7 Pf
8VDC LINE
10 Pf
.001
7T 1/8 OD
8VDC LINE
L4
1Pf
1.5K
13.8 VDC
INPUT
.27 Uf
78L08
8V REG
.27 Uf
10 Pf
* FOR 900 Mhz
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3.7VDC
2.2K
4VDC
.001
220
MRF-901
1.8-6 Pf
VARACAP
NTE610
10K
.001
.27 Uf
10K POT
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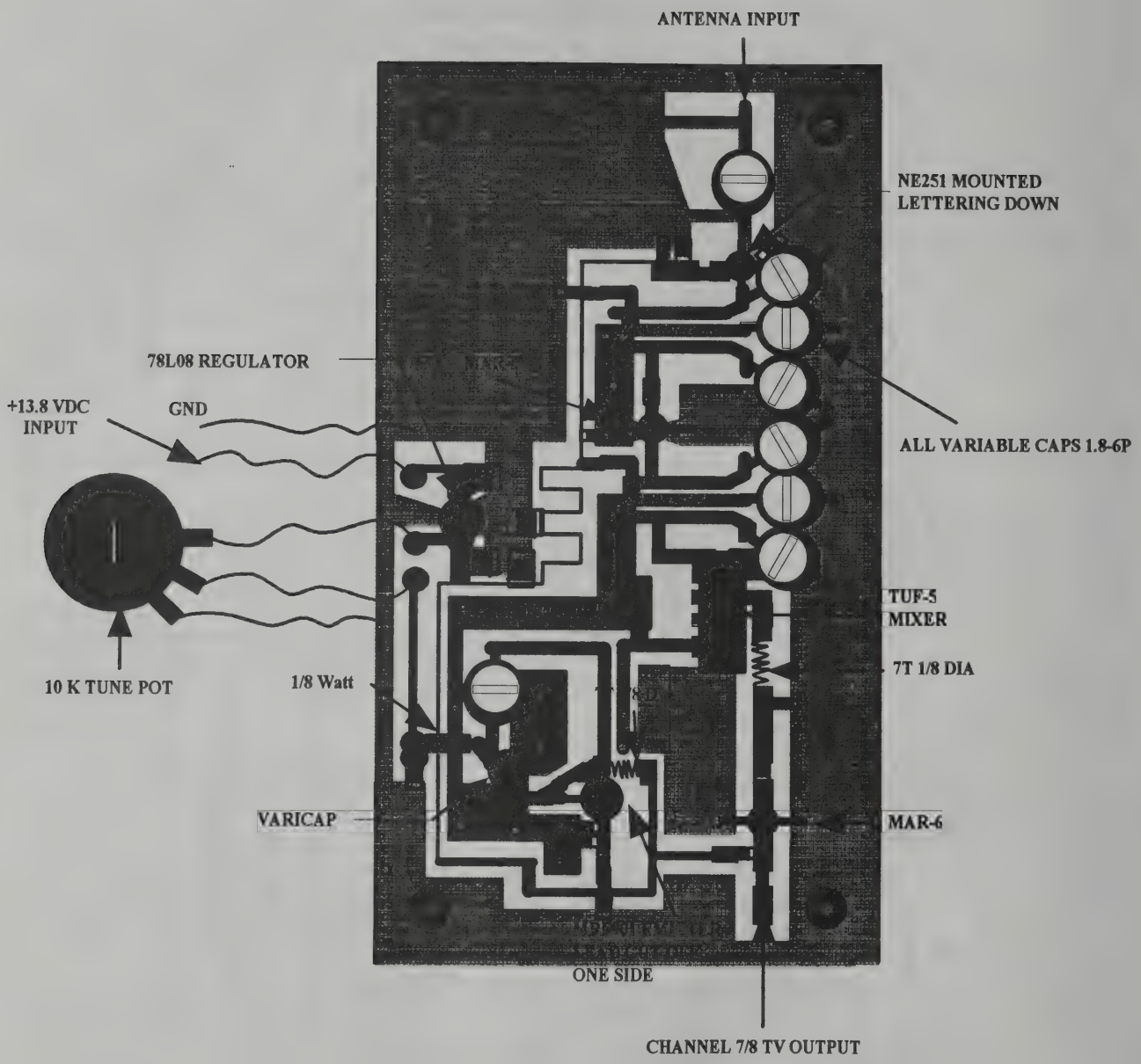
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NE251 MOUNTED
LETTERING DOWN
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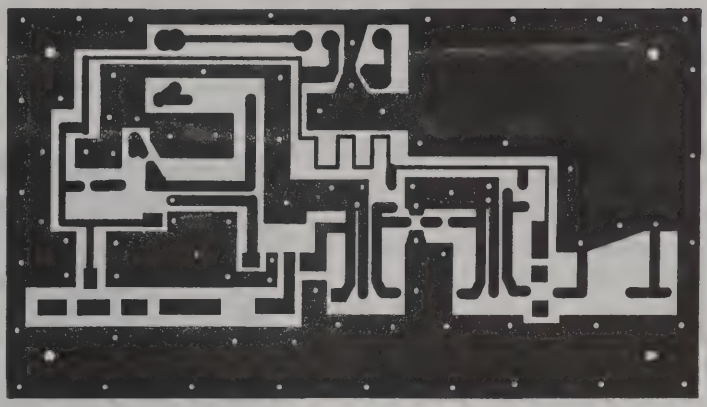
INPUT
GND
ALL VARIABLE CAPS 1.8-6P
TUF-5
MIXER
7T 1/8 DIA
10 K TUNE POT
1/8 Watt
VARICAP
MAR-6
ONE SIDE
CHANNEL 7/8 TV OUTPUT

the device, but the gain will be NILL.

The two charts show the SELECTIVITY of the 900 Mhz (32 cm) and the 1200 Mhz (23 cm) down converters. Notice the excellent selectivity on both bands.

The selectivity, especially on 900 Mhz, is very important as we need to reject adjacent channel interference such as land mobile, paging, and cellular telephone service.



Parts List

8 Mouser 24AA070 1.8-6P Surface Mount Caps
1 NE-251 Dual Gate GASFET (NEC)
2 MAR-6 Monolithic Amplifiers
9 .001 or 470 Pf chip caps
3 .27 Uf or .47 Uf chip caps
1 4.7 Pf chip cap
1 1.0 Pf chip cap
4(5)10 Pf chip cap (900 Mhz)
1 MRF-901 Transistor
1 Mini Circuits TUF-5 Mixer
1 78108 8v Regulator
1 ECG or NTE 610 6.8 Pf at 4v Varicap Diode
2 100 ohm 1/10 Watt chip resistors
1 3.3 K chip resistor
1 2.2 K chip resistor
1 1.5 K chip resistor
3 220 ohm chip resistor
1 Printed Circuit Board
1 10 K Variable Pot (tuning)
1 10 K 1/8 Watt resistor

PCB and Parts available from:
ATV World
3713 West Charleston Avenue
Glendale, AZ 85308
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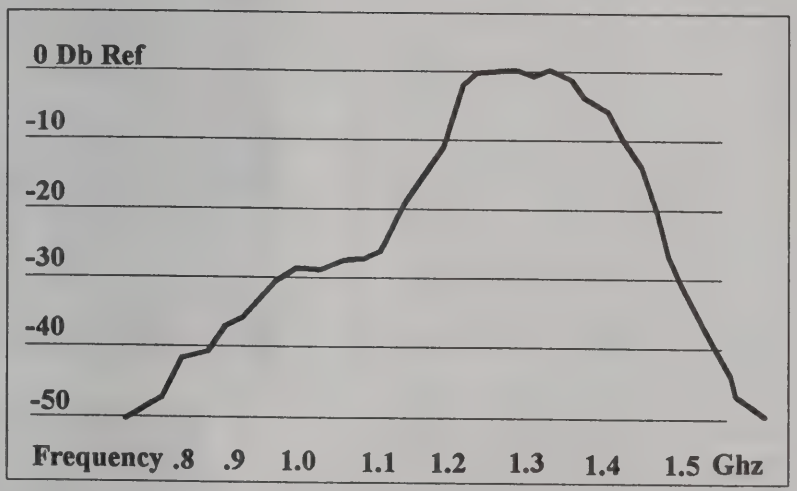
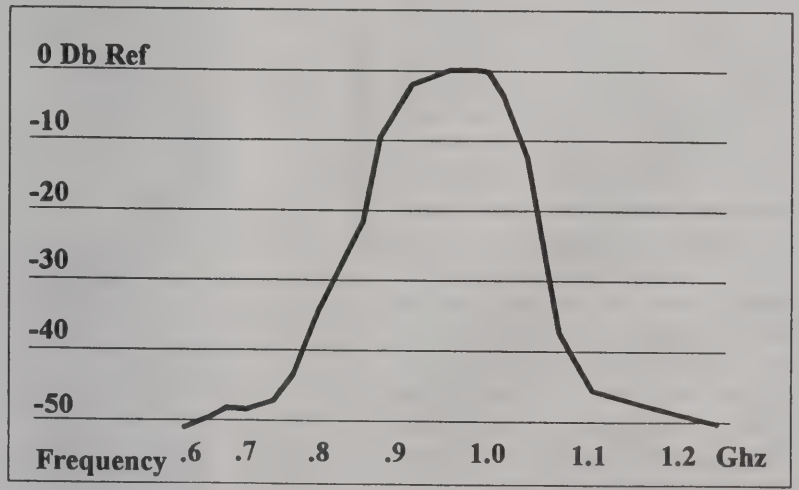
price ranges:
Assembled and Tested Unit $90. Parts Kit with Printed Circuit Board $70.Printed Circuit Board ONLY $20.



23 CM Selectivity



33 CM Selectivity

ATV NEWS

Earthwinds Balloon to Launch after Nov.15th!
Launch site will be near Reno, Nevada.

The Earthwinds around-the-world balloon flight has been rescheduled to lift off anytime after November 15th. The last launch attempt occurred last Feb. 22 and was aborted due to increasing winds and deteriorating weather at the Loral Airbase launchsite in Akron, Ohio. After an extensive search for a location with optimal ground winds, the launch team chose Stead Field near Reno, Nevada for the launchsite.

The pressurized gondola (suspended between a unique dual- balloon system) will carry three balloonists in a non-stop around-the-world flight at 35,000 feet. Typical wind patterns during that time of year should take the balloon from Reno, down to Texas, up through the Midwest and out over the East Coast during the first few days. From there the balloon should fly across the Atlantic, over Europe, Russia, Asia, Japan and back to the U.S. West Coast. The total trip should take between 2 to 3 weeks.

Pilot Larry Newman KB7JGM will activate a 10 meter SSB beacon (designed by Bob Rau N8IYD, Jud Nichols N8RXT and Bill Brown WB8ELK) during the flight which will give a periodic update of the balloon's latitude, longitude and ground speed based on data from the onboard Rockwell GPS receiver. Listen to 28.303 MHz at 15 and 45 minutes past each hour. Additional transmissions are possible at 30 and 55 minutes. Its hoped that the signals can be copied by a large number of amateurs and the balloon's position can be accurately plotted throughout its circumnavigation of the world!

Listen for news of the liftoff via ESPN and other major new networks. Then just tune in 28.303 MHz for the location.

Photo A. The massive Earthwinds balloon towers over the launch crew as they prepare for liftoff. Photo taken by Bill Brown WB8ELK during the February 22, 1992 launch attempt at Loral Airbase in Akron, Ohio.

Photo B. A sizeable contingent of area hams were present to view the liftoff attempt.

MORE ATV NEWS

Fenton, Missouri ATV Repeater

The W0ZGL ATV repeater is up and running from its location high atop a 938-foot ridge overlooking the St. Louis area. The repeater has an input on 910.25 MHz and outputs an 18-watt signal on 1253.25 MHz. The antenna system consists of Diamond gain verticals on both bands. The repeater's designer, Harry Anweiler, W0ZGL hopes to eventually link into the KD0LO ATV repeater (operating in another site in the St. Louis area with an input of 923.25 MHz and an output on 421.25 MHz). Listen to a talk frequency of 144.38 MHz for the local ATV activity. Contact Harry Anweiler, #17 Tree Crest Court, Fenton MO 63026 for more info.

Leyden, Massachussetts ATV Repeater

The KC1RH ATV repeater is active from a 1230-foot hilltop in Leyden. Ed Skutnik KC1RH installed the repeater at the site of his commercial FM radio station (WRSI-FM - 95.3 MHz). The repeater covers southeastern Vermont, Southwestern New Hampshire and the Connecticut River Valley area of western Massachussetts. The input frequency is 434 MHz with outputs on 421.25 and 1241 MHz. The repeater is vertically polarized. Stations as far south as northern Connecticut have seen the repeater. Listen to the Greenfield 2m repeater (WB1GUY/r) for ATV activity on 146.985 (- 600), a PL tone (4Z) may be occassionally required if co-channel interference is bad. Contact Ed Skutnik KC1RH at 58 Reservation Rd., Sunderland MA 01375 for more info.

Photo: Ed Skutnik KC1RH demonstrates the inner workings of the Leyden, MA ATV repeater.

Liquid Fuel ATV Rocket to Fly to Edge of Space

Late November/early December launch from White Sands, New Mexico.

David Crisalli of the southern California experimental rocket group called the Reaction Research Society plans to launch a 20- foot, 400 pound liquid fuel rocket to an altitude of over 200,000 feet sometime in late November or early December from White Sands, New Mexico. Mike Henkoski KC6CCC and Bill Brown WB8ELK are putting together an ATV payload and packet telemetry downlink system for the rocket.

The video downlink will be on 434 MHz (6-watts!) and possibly on 1265 MHz (FM) video. The camera should provide us all with spectacular views of the Earth as the rocket heads for the edge of space and parachutes gently (hopefully) back. A packet telemetry downlink can be received on 144.290 MHz (frequency not firm at press time). There will be an HF net operating on 7.243 MHz prior to and during the flight.

Anyone within 600 miles of White Sands, New Mexico should have a chance of viewing the video downlink. Packet messages will be circulated with exact dates and times as well as announcements over the weekly HF ATV nets on 7.243 MHz (West Coast, Sundays at 10 a.m. PST; net controls Dan K6DFM and Ron W6VCF) and 3.871 MHz (Midwest, Tuesdays at 8 p.m. EST; net controls Chuck WB9IHS and Joe WB9SBD).

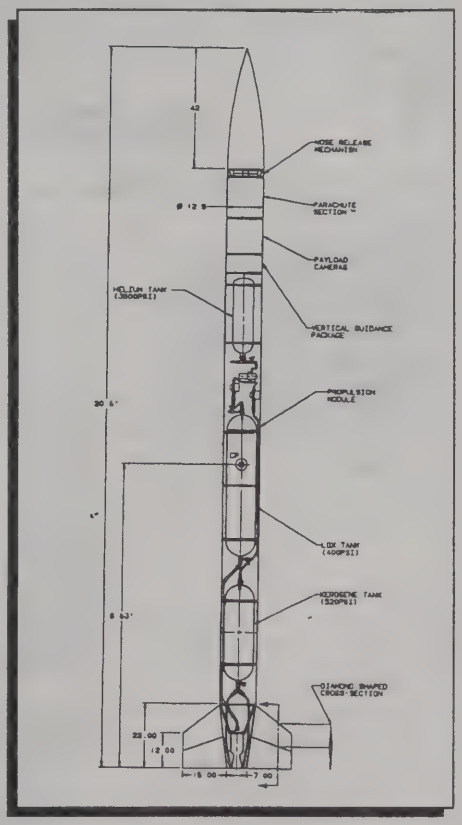


Figure 1. Diagram of David Crisalli's liquid-fuel ATV rocket.

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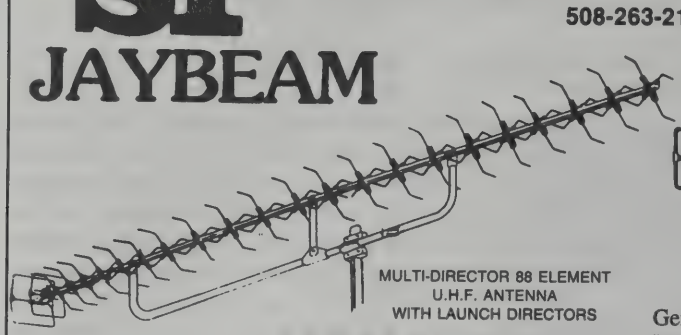

MULTI-DIRECTOR 88 ELEMENT
U.H.F. ANTENNA
WITH LAUNCH DIRECTORS

MBM88/70cm

MULTI-DIRECTOR 48 ELEMENT
U.H.F. ANTENNA
WITH LAUNCH DIRECTORS

MBM48/70cm

General Specs:-

Frequency Range	420 MHz - 450 MHz
Impedance	50 Ohms
(Built-in Balun)	

MULTI-DIRECTOR 28 ELEMENT
U.H.F. ANTENNA
WITH LAUNCH DIRECTORS

MBM28/70cm

	MBM28	MBM48	MBM88
Gain	11.5dBd	14.0dBd	18.5dBi
Beamwidth (E)	40 deg	28 deg	23 deg
(H)	45 deg	35 deg	28 deg
Boom Length	4 ft	6 ft	13 ft
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Loss (typ)	0.1 dB	0.1 dB	0.15 dB	0.2 dB	0.25 dB	0.25 dB
	$190.00	$160.00	$105.00	$105.00	$105.00	$105.00

Model	PSf421-ATV	PSf426-ATV	PSf439-ATV	PSf910-ATV	PSf1253-ATV
Loss (typ)	2.0 dB	2.0 dB	2.0 dB	2.5 dB	3.0 dB
Std conns.	BNC	BNC	BNC	N	N
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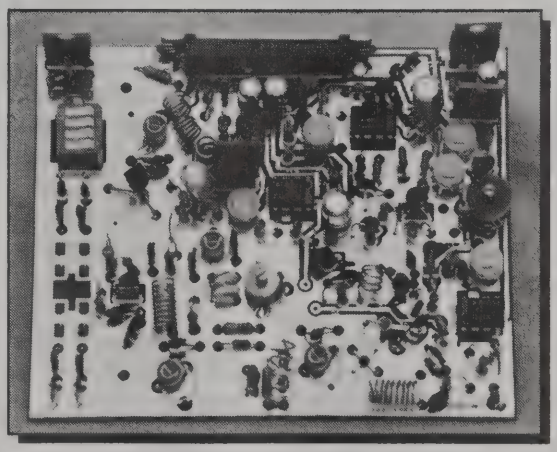
Greg Stayton, NT7L

Preliminary New Product Review of the ATV World Transceiver

Upon examination of the ATV-5TR CM ATV transceiver, the first thing one notices is the symmetrical intuitive front panel design (see picture). The control knobs are lined up across the unit. The TRANSMIT/POWER-OFF/RECEIVE and CAMERA-1/OFF/CAMERA-2 switches eliminate the need for two switches to support the functions of Camera-Off and Power-Off providing a simplified more readily understood control panel. Additional features not found in other transceivers are: a front panel transmit channel switch that provides four crystal controlled transmit frequencies; 5 Watt average transmit power (about 10 Watts peak) featuring the ATV Electronics 70 CM transmitter that some of you are already familiar with; an optional 1200 Mhz down converter that includes on board microstrip bandpass filtering and greater than 35 dB conversion gain providing clean operation in the most fearsome environments. During a side-by-side test of the competition and this unit at a frequency congested repeater site in California there was no interference to the down converter. I won't comment on the other units.



Rear mounted not poking through the rear panel RCA, BNC, and F-type connectors, and red and green front panel LED indicators illuminating during transmit and receive respectively. The 440 Mhz down converter provides excellent sensitivity and conversion gain also as determined by side-by-side comparison testing.

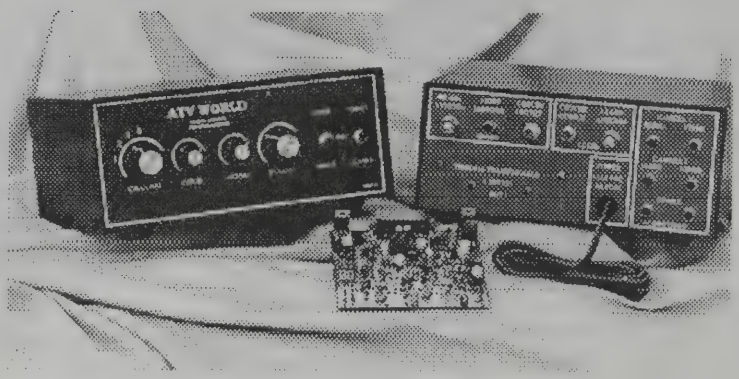
The 440 Mhz down converter includes the T/R switch and video monitoring circuit. The specifications for this down converter have yet to be measured, but it sure looks good!

The cabinet is manufactured by Ten-Tek and is a rugged design made of 060 aluminum with professional silk screen labeling, and even comes in two colors! (Gray or Red)

I have one more feature that needs to be mentioned! The price is only $399 for the 440 Mhz transceiver and the optional 1.2 Ghz receiver providing a dual receive transceiver is only $89 more. This means you get a dual receive transceiver with many exciting features for less than the cost of other competing single receive transceivers! All in all, a great buy for the money.

TECHNICAL REVIEW
ATV ELECTRONICS ATV-5
ATV TRANSMITTER

By WA6SVT



While I was in the Phoenix, AZ area, I stopped by to visit with local ATVers. I met with Earl Cambell, KS8J, and Greg, NT7L, owners of ATV Electronics. They showed me their ATV transmitter and asked me if I would be interested in evaluating the transmitter. At first viewing of the PC board, the layout is clean and board quality is very good. The board is silk screened on top to show component location. The bottom of the board is solder masked as well.

One feature I like is a 4-frequency switch (other ATV transmitters have a 2-frequency switch) which comes in handy if you travel on the road with ATV where you can easily change frequency without changing crystals.

The video modulator is very different from the normal modulator I have seen. The modulator uses an operational amplifier to drive a power MOSFET modulator, it also uses a LM1881 sync separator IC for sync stretching.

Transmitter stability is good, I did notice a slight shading to the picture when the 4.5 Mhz subcarrier injection is advanced full on.

Linearity is good and the sync stretcher control can give an extra 23 units of sync to drive transistor linear amplifiers. The video passband is flat from 30 Hz to 5 Mhz, probably wider but my video sweeper stops at 5 Mhz. I did not see a DC restoration circuit, but the video to sync ratio stays does not change much with large APL changes. Spurs and harmonics are down at least 50 dB.

Video intermods are low in the transmitter, the color-audio subcarrier 920 Hz bent pattern is so light it is hardly noticed even with highly saturated color with the subcarrier injection set at -16 dB below peak video carrier. Differential phase and gain are close to commercial specifications.

Audio is clean, no sync buzz even with the volume all the way up on my TV set. Frequency response is flat across 20 Hz to 6 Khz. Voice is clear and unmuted. The frequency drift of the 4.5 Mhz oscillator is fair about 3 Khz, from 20°F to 120°F. I suggest some temp compensation to improve the drift. Under normal operation, this should not be a problem.

Another addition, there should be a limiter to hold the voice peaks to 25 Khz. deviation Running the audio level to max caused deviation to hit 100 Khz. ATV Electronics will be incorporating the above improvements soon. Power output peak sync was measured at +39 dBm (about 9 watts at 13.V power). One nice feature is the power amplifier which is on the transmitter board. Size is 3.5" x 4".

Overall Evaluation

A good transmitter for the money. This is a new ATV manufacture and they are well on the right path to make a quality product. They are planning a complete ATV transceiver with a second receiver option 900 Mhz or 1200 Mhz for cross banding with 70 cm bands. They will be marketing their new transceiver under the company name of ATV World. The technical diagrams are professional (no hand drawing) and easy to follow.

For more information contact:

ATV Electronics (ATV World)
16807 North 46th Lane
Glendale, AZ 85306
1-800-4HAMTV

LIVE TV FROM (near) SPACE

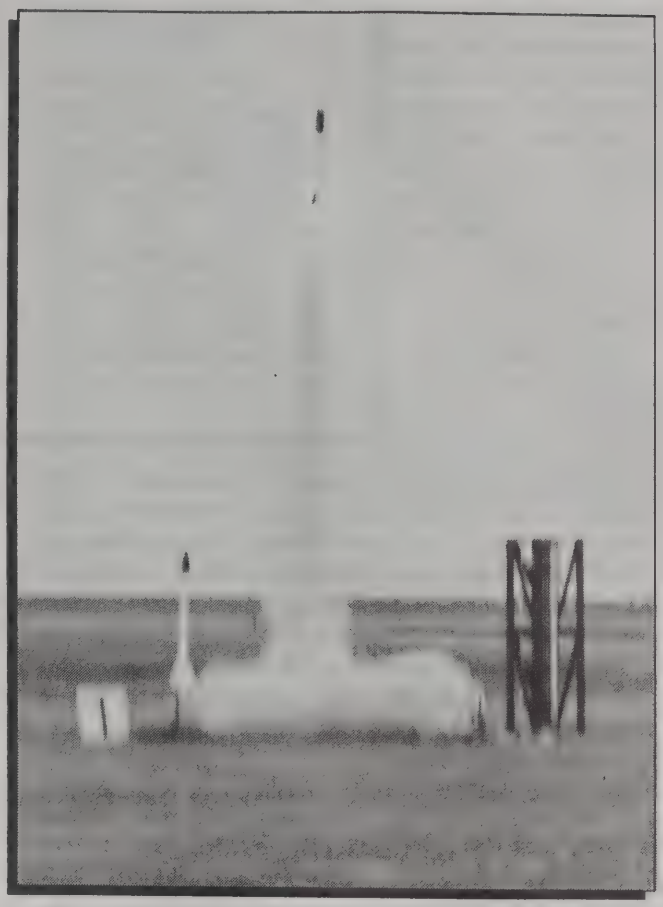
by Hugh Maher N5AVT

Halleluya, it worked! Good video from my rocket, broadcast live from liftoff through splashdown (well, it was muddy). I have been working on my TV transmitting payload for many months. In fact, this project began when a friend (Ron Dunn) mentioned an article about a model-railroad TV-camera (see the "Lionel Railscope" article in the April 1991 issue of ATVQ). That was a year ago, back in June of '91. I've been working on this project ever since. This is more a story of human persistence than of technical prowess.

Ron noted that he had read the story in a T-5 Newsletter that the HUVARS club publishes. Since that article was my only source of information, I called the "T-5" editor. He gave me Bob Rau's name and number. I then got in touch with Bob who turned out to be a fellow amateur radio operator (N8IYD). He had recently written an article in 73 Magazine about using TV transmitters in model rockets. That issue, August 1990, was devoted to TV installations in model rockets, RC airplanes, RC helicopters and balloons. Bob was a big help. He also markets all kinds of electronics hardware for model TV projects (High Technology Flight, 1450 Jeffery St., Ypsilanti MI 48198-6319; Tel: (313) 482-2670 - the Rocket BBS can be reached at (313) 482-2657).

The heart of the system is Lionel's tiny video camera called the Railscope (originally designed to fit inside of an HO scale model train). [Ed. Note: The Railscope is still available from Lionel for $69 + $5 shipping; call (800) 727-7297 or (313) 949- 4100 to order.] It is a low-resolution, B&W device that operates on 9 volts. However, it's designed to operate as part of a closed-loop system. That is, on the model trains, the camera/transmitter module is wired directly to the receive converter and monitor via the train tracks. That means I would have to design and package transmitting, receiving and converting systems.

After checking some prices, I decided to go for it. I set a target date of October 5, '91, at our club's big annual demo launch. I ordered the "Railscope" from Lionel, the transmitter (TXA5-RC) and the downconverter (TVC-2G) from PC Electronics. I installed the down converter in a Radio Shack aluminum box and powered it with a wall transformer/converter like many calculators use. I used a similar box in the rocket, except that I cut it down with a nibbler, so that it would fit into the payload bay. An aluminum spine on the back supports the video camera. I added a small bracket to support the battery pack, which contains 8 AA cells. Velcro and elastic hold the batteries in place. A 13.5 inch dipole antenna, epoxied to a square dowel, fits neatly in to the nose cone. As for the ground support equipment, I strapped a small B&W TV, a

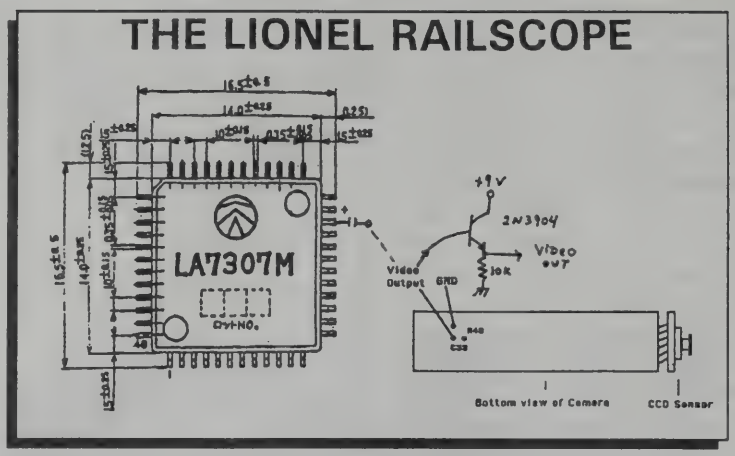


Rhapsody TV 628, the downconverter and my VCR onto a two foot piece of plywood that went into the back of my car. That left just enough room for the seven miles of AC cord needed at some launch sites.

It was now late September and I still hadn't put it all together and powered it up. I was afraid that I would cook everything! Then on October 1, I braced myself and threw the switch. It worked! With some minor adjustments I was able to walk around my house and transmit live video to my TV. However, there was still a lot to do before the 5th.

I had used my North Coast Phantom NCR 4000HD rocket for some successful 35mm camera flights, so I decided to use that same rocket. The Phantom 4000HD kit is available from North Coast rocketry, 13011 Branscomb Road, Huntsville AL 35803. Even with the 4-inch diameter tubing, the camera, transmitter, batteries, and antenna proved to be a snug fit. Since the fit was tight and the time was short, I decided just to cram the assembly in and add some bubble pack fore and aft.

The payload section weighed 2.3 pounds, so I was thankful that I had ordered a 50-inch chute from NCR. I wanted it to stay fairly close, so I chose an H123 reload for my 240 Ns ISP motor. The motors and reload are manufactured by Aero Tech, Inc., 1955 S. Palm St., Suite #15, Las Vegas NV 89104.



It was Saturday morning, October 5 at 6 AM. I still wasn't ready and waiting anxiously for the Radio Shack to open. More parts, more soldering, and more adjustments. Finally I arrived at the site where my fellow Tulsa Area Rocket Association (TARA) members had set up a huge static display. As the large crowd considered the contrast between a Bull Pup and a Bruiser, I parked my car near the hangar (to get AC power for the ground equipment). This horse ranch and private airport is the home of Ron and Dyana Jantzen.

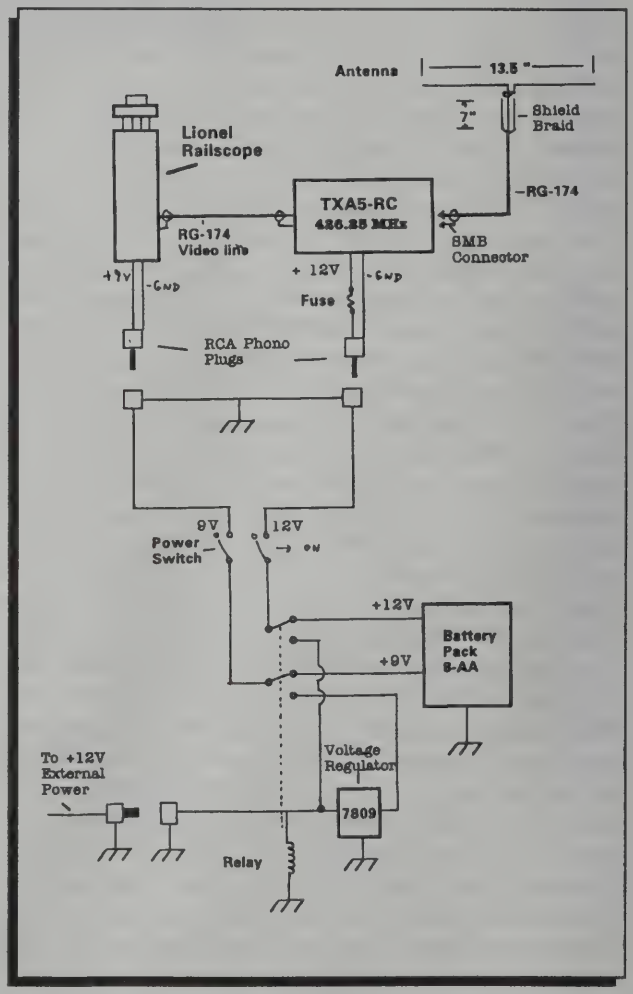
A fellow employee at FlightSafety International, Ron hosts this annual company fly-in and picnic each October. It was here, just two years ago, that I was first exposed to hobby rocketry during TARA's first demo. Boy was I hooked!

The launch began while I was still adjusting things. My 4000 rocket was on the pad and the LCO was explaining the complexity of this project over the PA to the crowd. I was all thumbs trying to start the VCR, tune the TV (hard to see in the sun), and tune the downconverter. I had to scream at everybody to relay instructions to the pad. Suddenly I saw Ron Dunn's face in the monitor. It's working! "Tell them to launch, tell them to launch, TELL THEM TO LAUNCH," I screamed.

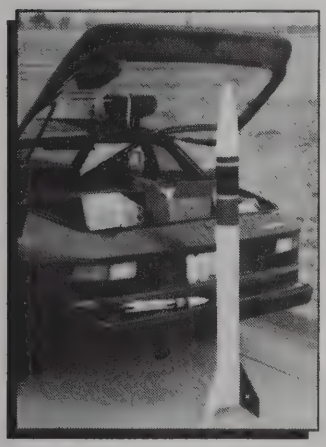
The first flight was successful, but the video was not very good. Post flight analysis revealed that the whole assembly had slipped in the payload bay and the camera lens had slid down past its porthole. Although annoyed with the results, I was encouraged to think that a secure mounting bracket was all that I lacked.

Attempt number two was set for our club launch on January 4. Besides the camera bracing, I was determined to improve the ground equipment packaging. I added a video output jack to my mini B&W for connection to a camcorder. That allowed me to do away with the VCR and its AC power requirements. Now all of the ground-equipment could be operated with portable power.

Again the flight was good but the video was lousy. I had sync problems and the transmitter seemed to be intermittent. During the post flight analysis some of the assembled rocket scientists allowed that the battery connections may be adversely affected during high-G accelerations. Rotating the battery pack 90 degrees removed the suspicion on the battery holder springs and I got ready for the next try.



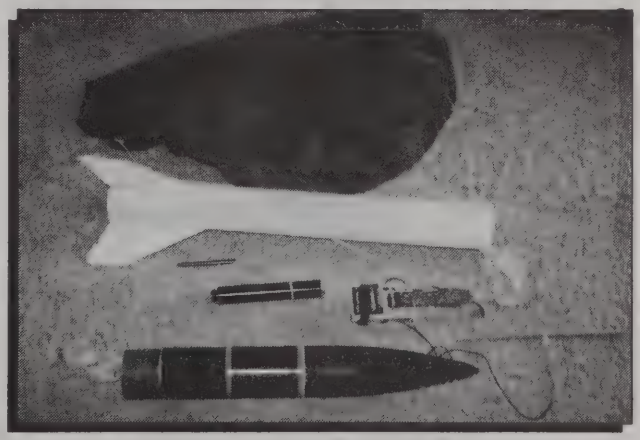
Attempt number three was at the regional "Kloudbuster II" launch in Argonia, Kansas on April 11. I had ground tested the system to apparent perfection and felt that everything was ready. So what happened? Same song, third verse; a very weak and badly sync'ed signal. Now I was getting discouraged. I again talked to Bob Rau and also to Dan Green in Illinois. On the basis of those conversations, I decided that the main problem at Argonia was weak batteries. The batteries are good for only 15-20 minutes and the on-ground tweaking and testing was eating up all the juice. To cure this problem, I added an auxiliary (ground) power connection to keep the internal (battery) power disconnected until the actual launch countdown.



The camera operates on 9 volts and the transmitter on 12 volts. In flight, the battery pack is tapped to provide the two power levels. On the ground, I added a 9-volt regulator to the external 12-volt power line. A relay, activated by ground power, does the switching. I also did some repackaging to improve the overall fit and reduce potential cable strain. I was pleased with the results. By using just a paper clip as the receiving antenna, I could now get good video from three house away. I was ready once again.

Attempt number four was at our June 7 club launch. Light winds and a fair sky had to be a good omen, right? On the first launch attempt of the day we had good video until the external power plug was disconnected, then video was lost. So off the pad it came and back to the prep area. I discovered that a battery had popped loose. While taping the batteries, I suddenly remembered that I had failed to install the black powder "ejection charge" in the RMS! The rocket gods must have been with me that day! The second time on the pad we had poor video on or off external power. I was so dejected that I decided to fly it anyway. However, the rocket gods weren't ready, as they prevented the copperhead from lighting the motor. Off the pad and back to the prep area again. While I was preparing a long thermalite igniter, a friend disassembled the payload and noticed a broken wire. Dale Bramer WB2ZUG not only has good eyes, but very steady hands as he had the assembly repaired, re-installed, and back on the pad in 15 minutes. On this third launch attempt of the day, the video was good, on and off external power.

OK, let's launch! The motor roared and off we flew. Screams of delight! Several members were watching the monitor and enjoying the ride, broadcast live via ATV. You could see the buildings as the spinning slowed down. Because of the way the camera was mounted the world was live, but upside down. At touchdown, some 800 feet away, the transmission continued. The handheld directional corner-reflector antenna from Radio worked superbly. The camcorder recorded the recovery crew picking the payload up and smiling at the camera. Since the batteries are one-shot items I decided to leave the transmitter on while I carried it back to the prep area. Even with the low-resolution recordings you could tell that I was grinning from ear to ear.



I owe a lot of thanks to several people for their encouragement and help. Freely given assistance and camaraderie are two major attractions of this hobby. This project took a lot of time and a fair amount of money, but the excitement of success I felt on that day was well worth the effort.

Let's see, if I use a 500 Ns reload we could really see some country. And next time I've got to make the video show right side up. Maybe a kevlar ribbon tied to the nose tip. Hmmm, Sooner Boomer VIII is just three weeks away.

Hugh was first licensed in 1978, he earned his advanced class in 1979. Interests include slow and fast scan TV. He manages a department that designs and builds simulated instruments and other products for flight simulators at FlightSafety International in Oklahoma.

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The book is available from ATVQ for $14.95 which includes all foreign exchnage band fees. Shipping is $1.50 US, $2.40 Canada, $3.70 elsewhere. VIsa/Mastercard accepted. ATVQ, 1545 Lee, Des Plaines, IL 60018. FAX 708 803 8994. Voice mail 708 298 2269. The book is so new it did not make it in time for our full order form elsewhere.

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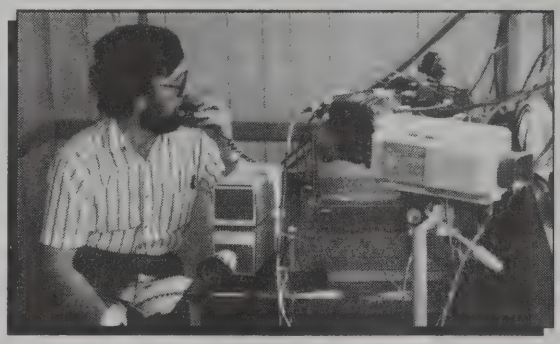
PS Form 3526, January 1991 (See instructions on reverse)

BALTIMORE FIELD DAY SITES CHECK EACH OTHER OUT VIA ATV

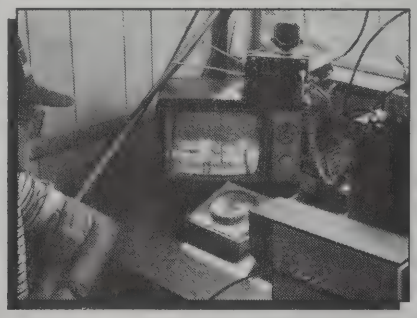
Fred Merker, K3TAZ & Bob Bennett, W3WCQ



This year Field Day was highlighted with a different twist for the ATV operators in the Baltimore area. Bob Bruninga, WB4APR, suggested that clubs share their Field Day activities by way of television. He encouraged the seven groups that were operating in the field during the weekend to show off their equipment and operation on ATV, so that all could check out the competition! All activity was done through the BRATS ATV repeater located in northeast Baltimore. Of the seven clubs contacted, there were three sites actually on the air from field locations during the contest weekend. The BRATS (Baltimore Amateur Radio Television Society, WA3DZO) site was located at the Baltimore County Fire and Rescue Academy in Towson, MD. The antenna was located on a six story building used for rescue training. Three Bobs, N3HAT, WA3SWA and W3WCQ, were the ATV operators. They had good color video through the repeater. The pictures of WA3DZZ when he didn't think the ATV transmitter was on had to be seen to be believed.

The Maryland Mobileers ARC (WA3PJQ) operated from Downs Park located in Anne Arundel County southeast of the city. Both Bob, WB4APR, and Andrew, WV1B, were operating from this location. They had set up a 40 foot telescoping mast that was guyed at several points along its length. The ATV down-converter and transmitter were located at the base of the mast. At that point they used a RF amplifier and then split the feed to the three Field Day operating positions that were separated by several hundred feet. All three positions could watch the ATV repeater by simply tuning a television to channel 3. Each of the operating positions could also send video back to the ATV repeater by using the same RF cable used for the down-converted signal. The Mobileers had a nice P4 color picture into the repeater. There were more pictures of the food pavilion than of the radio gear - those guys know what's important!

Carl, KA3UPR, was on the air with his Explorer Post #562. This group was located near the Towson Moose Lodge in the Baynesville area of Baltimore County, just north of the city. The Explorers whose post is sponsored by the Towson Moose Lodge, even had great pictures after dark using lantern light. The site is about four miles from the repeater, on a ridge which gives a nearly line-of-sight path. The explorers got a good object lesson about antennas and transmission lines. When they first started, they had the antenna on a tower, with poor results. When they moved the antenna to a small ladder, the results were much better. On that ridge, height didn't buy anything, and the long transmission line ate the signal!



The original thought behind this activity was for each group to transmit for about 15 or 20 minutes, in a sort of round table. This would give sufficient time to show the activities of the respective organizations. Unfortunately, with only three stations operating there really was not enough activity to keep the repeater on the air continuously. Later in the afternoon, the Field Day stations were joined by Heru, W3WVV; Lon, W3DID; Steve, K1BYD; and Henry, WB3JXE from their home QTHs. Steve often transmits video from the space shuttles through the BRATS ATV repeater, and WB4APR suggested that he do that, since a shuttle was in orbit on Field Day. The pictures were most impressive to visitors at the various Field Day sites. Now that the concept of Field Day ATV exchanges has been successfully demonstrated, Bob is hoping that next year more clubs will plan ahead, so there will be more activity from the field sites and the repeater will be up with video during the most of the event.

Pictures by Bob, W3WCQ

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NTSC SYNCH SEPARATOR FOR STABLE TRIGGERING OF OSCILLOSCOPE VIDEO WAVEFORM DISPLAYS

(Poor Man's Waveform Monitor)

Mike Dees, N3EZD

Have you been frustrated by video waveforms which are difficult to read on your oscilloscope? Do you have to readjust the trigger level every time the scene changes? If so, the solution to your difficulty is at hand.

This article describes a simple circuit that will allow a triggered sweep oscilloscope to provide the most important capability of a video waveform monitor, a stable display of the video waveform. The video waveform is the most complex waveform we are likely to experience. Because of its constantly changing level and its many different short duration components, it is difficult to obtain a stable display using conventional AC, DC, high pass or low pass trigger coupling. A stable display makes analysis and adjustment of video processing and transmitting equipment much easier. Every ATV operator should have the ability to view the video waveform.

Many of the oscilloscopes that are sold for use in servicing video equipment have trigger positions for viewing waveforms at a horizontal or vertical rate. Even if you have this type of scope, you may want to build this circuit because it offers more display options and also allows the synchronization (gen-lock) of a video device with an external sync input to another video source.

Many high quality scopes intended for uses other than video servicing and many excellent scopes available on the surplus market do not have provisions for stable triggering on video signals. With the addition of this simple circuit, stable displays are possible on any triggered sweep scope.

The circuit in figure 1 will allow a triggered sweep oscilloscope to display a stable video waveform which is triggered on each field, each odd field, each even field, or each line. With an oscilloscope that includes delayed sweep, a stable display of several lines, one line, or just a portion of an individual line is possible. This is particularly useful for examination of vertical interval test signals.

The circuit uses an LM1881 video sync separator integrated circuit. This IC strips timing information from NTSC, PAL or SECAM video signals, and provides composite sync, vertical sync, odd/even field, and burst/back porch outputs. The device operates on 5 to 12 volts DC and accepts a video input signal between .5 and 2 volts p-p. The 10k input impedance will not load the video line when it is connected. The device draws less than 10 ma making it suitable for operation from a 9 volt battery. The device is available in an 8 pin plastic DIP as part number LM1881N. The pin-out for the IC is as follows:

Pin No.	Function
1	Composite sync output
2	Composite video input
3	Vertical sync output
4	Ground
5	Burst/back porch output
6	Rset
7	Odd/even output
8	Vcc (5 - 12 VDC)

The application note for the LM1881 contains schematics for two video applications: (1) a video line selector - a circuit which puts out a single line of video according to binary coded information applied to eight control lines; and (2) a multiple contiguous video line selector - an elaboration of the first application to allow the selection of multiple adjoining lines. These applications are interesting but more complex than is necessary for our purpose at the moment. The same capability can be obtained by using the sync separator and a scope with delayed sweep.

The optional low pass filter shown in figure 1 will usually not be necessary if the circuit is used with clean NTSC signals. Not all devices generate video signals that meet all of the specifications for an NTSC signal and if the signal has excessively video peaking or high frequency noise, the filter shown will allow proper recovery of the sync components. The filter will introduce an additional delay of approximately 100 nsec in the sync signal outputs.

SYNC SEPARATOR

Use of the LM1881 for Video Waveform Display

In all of the procedures listed below, connect the video source to the oscilloscope vertical input and to the input of the sync separator, set the vertical coupling to DC, set the vertical sensitivity to 0.2 V/div and connect the output of the sync separator to the oscilloscope external trigger input with the scope trigger source set to external. The use shielded cable for all signal line connections is recommended.

Vertical Field Waveform Display

The vertical field waveform can be displayed in one of three ways: (1) each field is displayed; (2) each odd field is displayed; or (3) each even field is displayed.

1.To view a waveform that begins at the beginning of each vertical field (both odd and even), set S1 to position A, set the scope horizontal sweep speed to 2 msec/div, set the scope to trigger on a positive level transition and adjust the trigger level for a stable display.
2.To view the waveform that begins at the beginning of each ODD vertical field, set S1 to position B, set the scope horizontal sweep speed to 2 msec/div, set the scope to trigger on a positive level transition and adjust the trigger level control for a stable display.
3.To view a waveform that begins at the beginning of each EVEN vertical field, set S1 to position B, set the scope horizontal sweep speed to 2 msec/div, set the scope to trigger on a negative level transition and adjust the trigger level control for a stable display.

The odd fields of the video waveform can be identified by the presence of a half line of video as the last line at the bottom of the field. Even fields end with a full line of video.

Horizontal Line Waveform Display

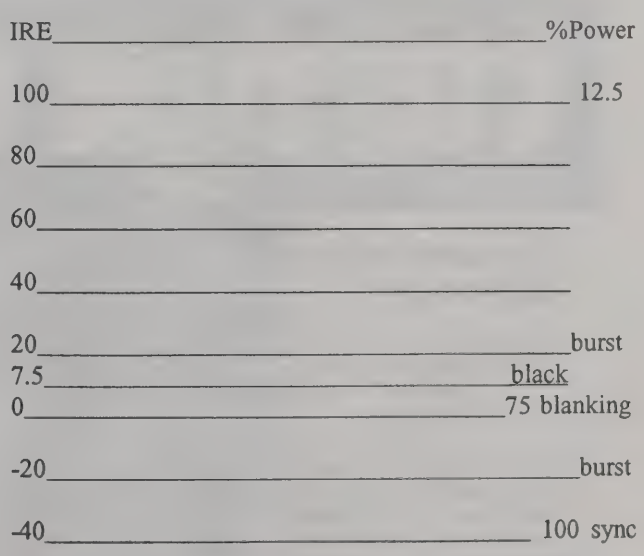
The horizontal line waveform can be displayed in one of two ways: (1) every line is displayed in an overlapping fashion; or (2) an individual line.

1.To view a waveform that begins at the beginning of each video line, set S1 to position C, set the scope horizontal sweep speed to 10 µsec/div, set the scope to trigger on a negative level transition and adjust the trigger level control for a stable display.

2.To view a single line of video (i.e. line 14 of field one) you need an oscilloscope with delayed sweep. Set S1 to position B, set the scope horizontal sweep speed to 2 msec/div, set the scope to trigger on a negative level transition for field one or to trigger on a positive level transition for field two, and adjust the scope trigger level control for a stable display. Once a stable display is obtained at the field rate, activate the delayed sweep mode and increase the scope delayed horizontal sweep speed to 10 µsec/div. Adjust the sweep delay control to move through the field displaying a line at a time. The scope delayed horizontal sweep speed may be varied to display a portion of a line or to display several lines at once. The brightness of this display will be considerably less than that of the other displays. This is due to the low duty cycle of the displayed line. Only one line out of the possible 525 lines is drawn on the screen. The line is drawn in 64 microseconds but the scope must wait 33.3 milliseconds before the line can be drawn again.

The most useful displays for routine adjustment and monitoring of video signals are the first ones listed in the above procedures.

The use of a video waveform monitor and the analysis and interpretation of video waveforms has been covered previously in ATVQ. See page 49 of the Fall 1991 edition of ATVQ. A video waveform monitor is equipped with a graticule similar to the one shown below.



The use of such a display greatly simplifies the adjustment of equipment in an ATV station.

SYNC SEPARATOR

Use of the LM1881 as a Gen-Lock Sync Source

Another use for this circuit is to strip sync information off a composite video signal to provide composite sync to a video device that provides for an external sync signal input. This will allow you to gen-lock two video sources together for mixing, switching, or character insertion.

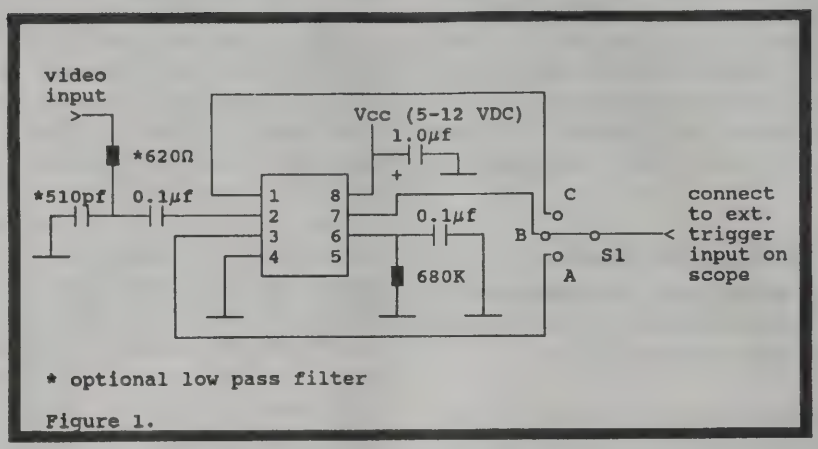


Figure 1.

To use the circuit for this purpose, apply the video signal that will be the master sync to the circuit input, set S1 to position C, and distribute the circuit output to the external composite sync input of the slave device.

The LM1881 packs a lot of capability into a very small device and could also be used as the foundation for other equipment such as a video signal processor, transmitter sync stretcher, and character insertion.

This simple circuit goes a long way toward providing the capability of a commercial waveform monitor. Now if we could provide DC restoration and DC couple the signal to the scope, we would have a level stable display as well as a time stable display

. . . then add selectable high pass and low pass filtering to the scope . . . hmmm . . . now where did I leave that data book? Stay tuned.

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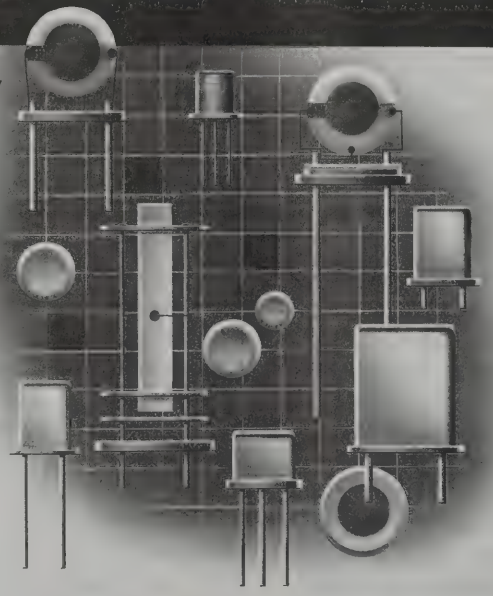

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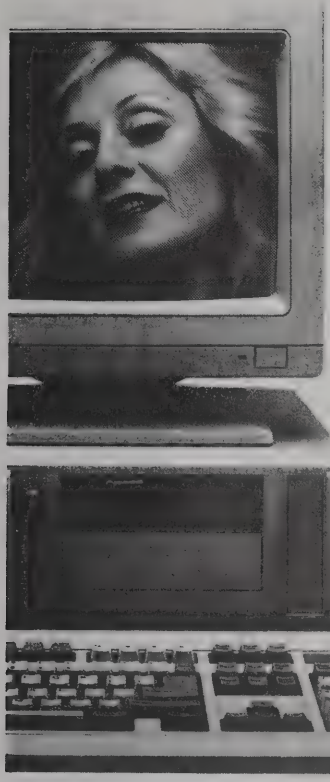

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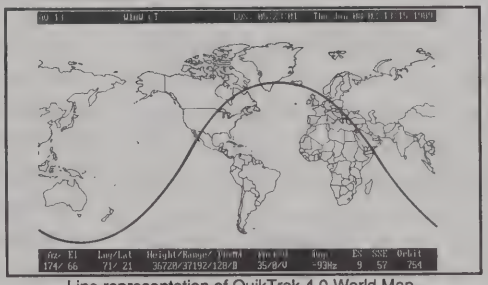

Line representation of QuikTrak 4.0 World Map

QuikTrak 4.0

Whether you want to identify the next time Oscar 13 will provide communications between two cities or if you just want to know the next time you can visually sight the Soviet space station MIR, QuikTrak will let you plug in the latest Keplerian elements for up to 100 satellites using a new full screen editor. QuikTrak also supports autotracking. *Hardware requirements*, IBM PC, AT, PS/2, or clone with a minimum 512K memory. CGA or EGA graphics required. Numeric coprocessor not required but recommended.

InstantTrack 1.0

For those concerned with greater speed and capability, InstantTrack offers all of QuikTrak's features plus instant visibility for your "favorite" satellites before you issue the first keystroke. More than 200 satellites and 1754 cities are on the menu and will be in full-color high-resolution EGA or VGA modes. *Hardware requirements:* IBM PC, AT, PS2 or clone with at least 512K memory. EGA or VGA graphics required. Numeric coprocessor not required but recommended. Mouse not required but can be used on the map screens.

These are only a few of the features of QuikTrak and InstantTrack. The figures below reflect suggested donations to defray production expenses and benefit AMSAT's non-profit, educational activities.

Recommended Donations:	Member	Non-Member
QuikTrak 4.0 5 -1/4"	$55	$75
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CONTROL OF AN ATV TRANSMITTER BY USING THE VIDEO CAMERA PAUSE LINE

By Mike Dees, N3EZD

The circuit shown in figure 1 was developed to allow remote control of an ATV transmitter by using the pause control circuitry built into consumer grade video cameras designed for use with a separate video recorder. The circuit may be used with any video camera with a pause output line that applies more than approximately four volts to the line.

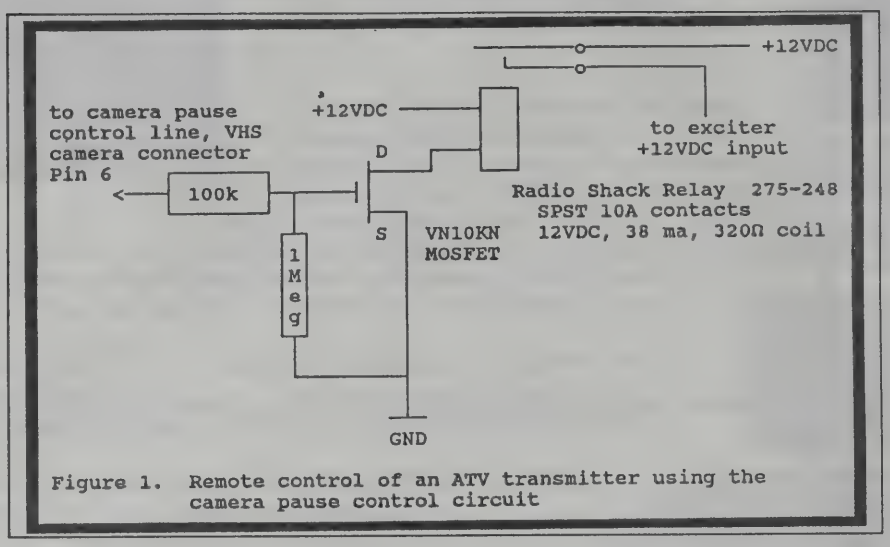

Figure 1. Remote control of an ATV transmitter using the camera pause control circuit

This circuit has been very useful for general use and for public service ATV activities coordinated by the Baltimore Radio Amateur Television Society (BRATS). The BRATS 439.25 MHz ATV repeater is located in northeast Baltimore, Maryland, and hosts an ATV net on Thursday nights at 9 p.m. with audio on the 147.03+ MHz repeater. If you are in the area, drop by and check in—all are welcome.

Many video cameras were designed to apply a positive voltage of approximately six volts to the pause line (VHS connector pin 6) when the camera operator presses the pause switch to switch the video recorder from pause to record. The ability to source current from this line is usually very limited. This control voltage is easily used for control of an ATV transmitter from the camera without additional cables.

Some video cameras have the voltage levels of the pause line reversed from the above description. If this is the case with your camera, either add a MOSFET or bipolar inverter stage between the MOSFET and relay shown in figure 1, or just remember that the state of the transmitter will be opposite of the record indicator on the camera or in the view finder. Also, some cameras may have a switch to invert the signal on the pause line. This switch may not be immediately obvious, look on the bottom of the camera—the switch may be accessible through a small slot in the case.

Several approaches were considered before the final configuration was selected but were discarded because of current drive requirements or complexity. Since the control was intended for battery powered portable operation, a relay was selected for the switching element to minimize any voltage drop through the device. The relay selected is small, inexpensive, has low drive requirements, and is readily available.

An inexpensive power MOSFET was selected as the active element to interface the pause line with the relay coil to provide additional protection to the MOSFET. With the MOSFET relay driver the load resistance seen by the pause line is greater than one megohm.

Except for the specified MOSFET, all of the parts can be obtained from Radio Shack. The MOSFET is available from several mail order companies, and is also available through several lines of replacement components; I obtained mine at a local Active Electronics outlet. This MOSFET is an extremely versatile device and any active builder should keep several on hand. A higher priced alternative to the specified MOSFET is the IRF-511 power MOSFET available from Radio Shack (276-2072).

The circuit was built on a one inch square piece of perf board and installed in the ATV exciter enclosure. Total cost of the parts if purchased new should be under five dollars.

SILENT KEY

Brother Gerald Malseed, F.S.D., W3WVC

The ATV community has lost one of the pioneers in this mode in the Baltimore and Philadelphia areas. Brother Gerald, W3WVC, passed away on August 27, 1992. Brother Gerald became interested in electronics as an army radio operator in World War II, and obtained his ham ticket in 1953. He was a graduate of LaSalle University and Villanova University, where he earned two master's degrees. He had been a member of the Brothers of the Christian Schools for 44 years.

During his thirty-one years as a math and science teacher at Calvert Hall College High School in Baltimore, Brother Gerald's ham radio club brought the pleasure of ATV operation to dozens of students, many of whom are now licensed and active in Baltimore. He was a member of the Baltimore Radio Amateur Television Society (BRATS), and his lab at the school was the birthplace of much of the original equipment used in WR3AHM (now W3WCQ/R), the second ATV repeater in the country. Until his return to LaSalle in Philadelphia in 1984, he was on the air with ATV nearly every night, and was always ready to help newcomers with ATV problems. More than one W3WVC-converted CMU-15 is still on the air! He remained active on ATV in Philadelphia, where he was born in 1921.

He, along with two former students, started the Greater Baltimore Hamboree (better known as the Calvert Hall Hamfest), which evolved into the Baltimore Amateur Radio Club (BARC) hamfest in Timonium, Maryland. In promoting ATV, the Hamfest, helping students acquire ham licenses, and being an outstanding teacher, he has made a significant impact on ham radio in Baltimore and Philadelphia. He will be missed.

ATV NEWS FROM AMATEUR TV NETWORK OF THE SOUTHWEST

Mike, WA6SVT

A new TV repeater is now on the air on MF Breckenridge at 7600 feet near Bakersfield, CA. Paul, N6VLV, and Mike, WA6SVT, built the repeater and with the help of Matt, KC6ACX, and John, KK6NJ, installed it several weeks ago. Input is 434.0 Mhz, output 1277.25 Mhz, linked to Southern California via the WB6VVV repeater.

Coverage is the San Jacquene Valley from the Grapevine south to Fresno to the north. Also, some coverage to the foothills on the central California coast. A station from Cambria, 200 miles away running 20 watts to an omni antenna was P3 into the machine. Anyone needing more information or would like to donate to help defer site rental, can write to Mike Collis, PO Box 1594, Crestline, CA 92325.

ARRL NATIONAL CONVENTION ATV FORUM

Mike, WA6SVT

Jim, KC6A, and Mike, WA6SVT, were co-speakers at the ATV forum. The forum was divided into three areas: (1) introduction video to ATV operation, (2) technical session (parts 1 and 2 were given by Mike, WA6SVT), (3) space shuttle ATV contact and the link from a school to the shuttle (Jim, KC6A, and his crew). ATVQ sent us a care package of magazines and info sheets. Tom, W6ORG, prepared and sent us a local area information sheet. Jim and I would like to thank Henry, KB9FO, and Tom, W6ORG, for the written ATV handouts.

SAREX NOTES:

The SAREX FSATV experiment was very successful. Analysis of the on-board video tape reveals pictures from all of the ground stations, and received video on each orbit attempted. This was better than we originally thought because the crew was not always able to monitor the equipment and reply on 2 meters. Both color and sound was recorded in some instances.

Signal strengths were not as strong as we would have liked. This is due to several reasons, all of which are being addressed for the next flight. We learned much from this first time experiment and I expect many enhancements that should provide excellent results in the future flights. I have already modified the prototype receive module for improved sensitivity, better out-of-band signal rejection, and reduced power consumption. I have also delivered a new prototype FSATV flight antenna to NASA that should not only improve results, but may lead to an FSATV receive experiment on non-SAREX missions.

Ground station requirements are also well defined now. A large range of ground station ERP's was used during the STS-37 experiment. Three ground stations used small single bay arrays that helped to define the minimum requirements. Only the far northern stations like WA3NAN and N9AB used high ERP (500 - 1000 KW peak). However, our path loss was 2 "P" units from optimum. 73 Andy N9AB

RAMPART HAMVISION NETWORK

This update is intended to spark some interest in current RHVN activities in the Colorado Springs area. The "input" receiver is crystal-controlled on 911.25 MHz, and it can be accessed with slightly modified "home" TV equipment available for under $50.00 at discount stores. This includes a transmitter and a receiver plus the little wall transformers! Most sets have "baseband" inputs and outputs plus the usual "channel 3" RF connections. This 900 MHz stuff is state-of-the-art, using SMT components! The transmitter boasts about 10-milliwatts output, but several sources can supply "brick" amplifiers for the band. If the sets you select use a voltage-controlled-oscillator (VCO), you only need to readjust the frequency pot. A new "nano-wheel" array was obtained from W6OAL's Olde Antenna Lab in Denver. This is a 4-wheel, horizontally polarized antenna with 6 dBd gain at 911.25 MHz. It is supported by a framework of PVC plumbing pipe.

Output frequency for the RHVN repeater will be vertically polarized on 421.25 MHz, which exactly coincides with CABLE CHANNEL 57 on any cable-ready VCR or television receiver. Signals have been "squirted" over much of the city with both color video and on-carrier audio, which brings me to a new subject: Audio on a video (fast scan) ham signal shouldn't be "MUSIC" (whatever that means). FCC Part 97.113(d) disallows MUSIC on the amateur radio frequencies. Yet, it is OK to transmit DTMF tones for control purposes. Also, "dual tone" multi-frequency can be construed to be a "duet" by some musicians! Is this MUSIC? Is MCW a type of MUSIC? Samuel F. B. Morse may have thought so! To comply with Part 97.113(d), I intend to restrict the audio channel on the RHVN repeater to sound effects and voice only. (Please don't sing!) There are large collections of sound effects available, synthesized by computer technology. For example, my Macintosh produces stuff like "giggled gulp", "choo-choo", "alien gun", "buddle buddle" and "chopper", and many others. If you see-hear the repeater on the air, it will have strictly non-musical audio content. Tune in, you might like it!

IN RECOGNITION

Charles P. Ginsburg, the man who led Ampex Corporation's development of the world's first practical videotape recorder (VTR) in 1956, died April 9 at his Eugene, OR home at the age of 71.

Creating the first significant technological breakthrough since the invention of television itself, he headed a six-man development team that won the race with giant RCA and others to develop a workable system that could record and playback both audio and video.

Ampex received an EMMY in 1957 in recognition of the development of the VTR, the first of 11 awarded to the company.

Ginsburg won many honors, including his induction into the National Inventors Hall of Fame in 1990. Dave Detmers, Ampex Redwood City, CA

NEW UNIVERSAL PEAK DETECTOR CIRCUIT FOR ANALOG WATT METERS

HI-RES COMMUNICATIONS, INC. has just introduced the PDC-1 Peak Detector Circuit. This universal peak-hold circuit converts any averaging type wattmeter to a peak reading wattmeter with an adjustable hangtime for the needle. Meter calibration and accuracy remain unchanged after the insertion of this circuit inside the wattmeter. The circuit has two simple adjustments, the first is the calibration and the second is the time constant (hangtime). The needle's hangtime can be adjusted from 1/10 sec. to 10 sec. Installation is a breeze, all that is required is a DPDT switch to switch the circuit in and out of the line from the wattmeter's circuitry to the meter itself and a power connection (6.3 VAC for the Collins 312B-4/5 or 6-12 VDC for other meters).

The PDC-1 was designed by C. J. Hawley (KE9UW) for use in the Collins 312B-4/5 station consoles, but can be matched to any conventional averaging wattmeter. Even expensive, highly accurate meters can be fitted with this circuit without any loss of accuracy! The PDC-1 measures 2" x 1.5" and fits neatly inside most wattmeters without any modification. Dealer inquiries are welcome. For more information contact: Floyd Soo (KF8AT) HI-RES COMMUNICATIONS, INC. 18464 Ash Creek Drive Mt. Clemens, MI 48044 (313) 228-1600

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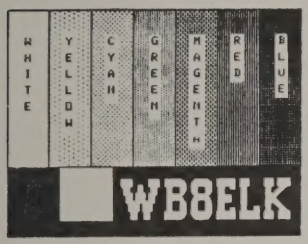

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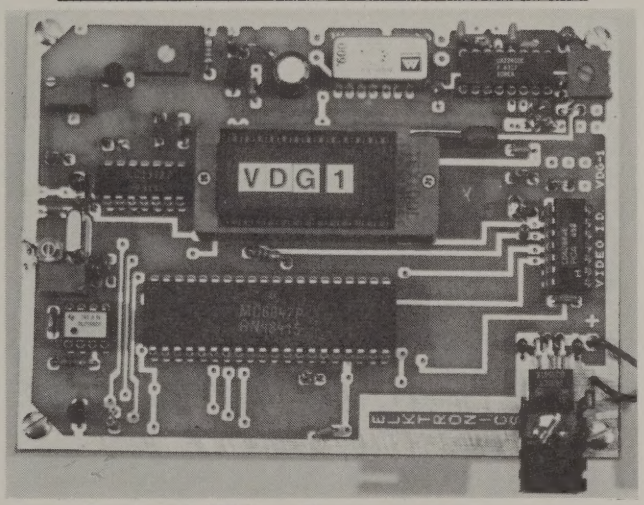

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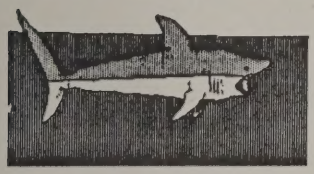

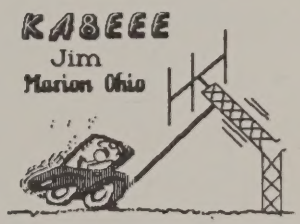

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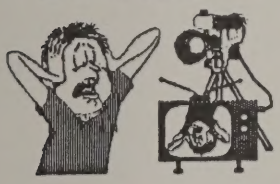

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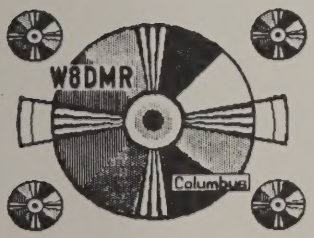

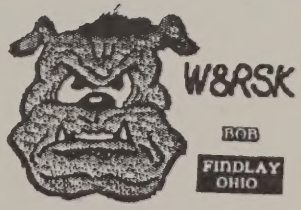

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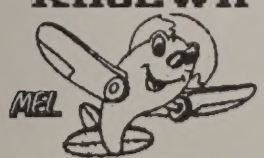

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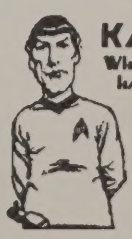
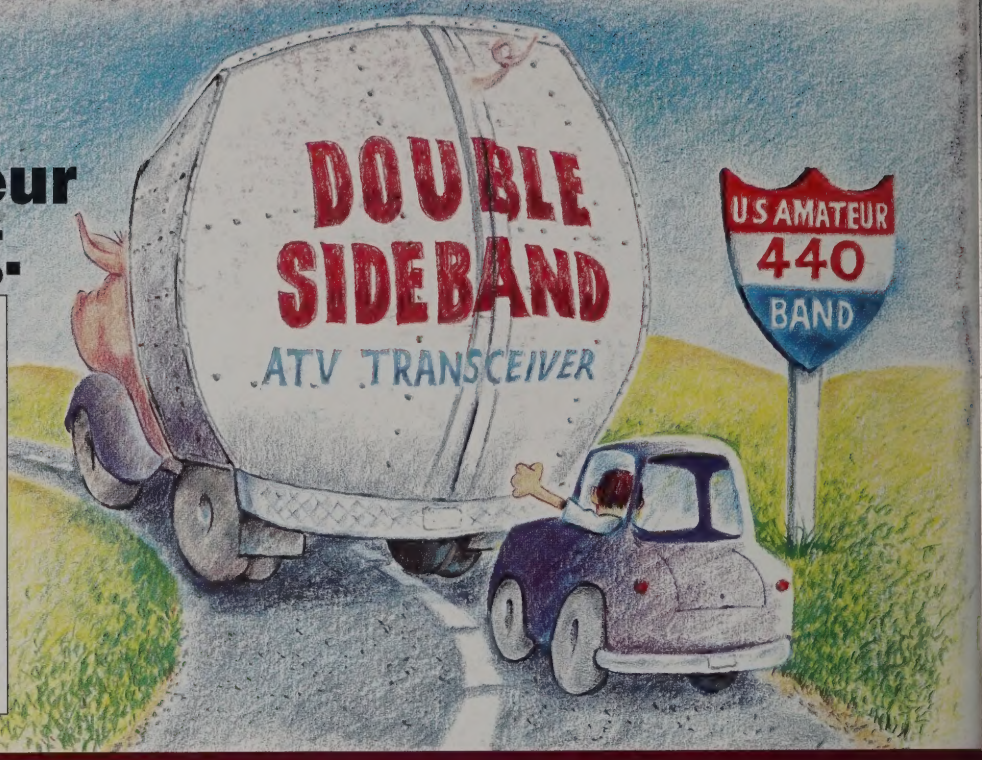


KA8WLV
WHERE NO ATV'ER
HAS GONE BEFORE

Don't Be An Amateur Band Hog.

If you're using a traditional double-sideband (DSB) Amateur Television transceiver, you're, in effect, hogging the band. DSB not only wastes power on the unused sideband, but uses almost twice the spectrum necessary. Not good, considering how limited the spectrum is to begin with.



VSB-70 with Vestigial Sideband

The VSB-70 from AEA is the only amateur television transceiver that uses Vestigial Sideband (VSB), the same modulation method used by commercial TV stations. Our VSB technology reduces the unwanted sideband over 40dBc! More power where it should be and less wasted spectrum space.

Also available is the RLA-70 mast-mount linear amplifier (with power supply), which boosts your signal while preserving the characteristics of VSB.

Be a good spectrum neighbor. Use the AEA VSB-70 ATV System.

For a complete specification sheet on the VSB-70 or any other product, call 1-800-432-8873.

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